

Fisher & Paykel

Service Manual

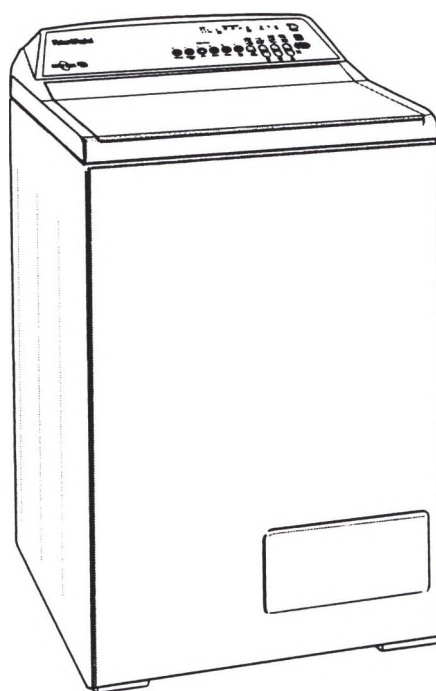
SMART DRIVE ELECTRONIC WASHING MACHINE

MODELS

GW503 – GW603 – GW703

MW053 – LW035

230 Volt 50 Hz



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ELECTRONIC AUTOMATIC WASHING MACHINE SPECIFICATIONS

MODELS

GW503/GW603/GW703/MW053/LW035

Finish

Cabinet Prepaint (Polyester)
Lid Polypropylene
Console Polypropylene
Inner bowl stainless steel grade 430T
Outer bowl Polypropylene
Agitator Polypropylene
Top Deck Polypropylene
Touch Panel Polycarbonate

Dimensions:

GW503/MW053/LW035

Height to Lid
closed 900mm-930mm
open 1280mm-1310mm
Width 560mm
Depth 560mm

GW703

Height to Lid
closed 900mm-930mm
open 1350mm-1380mm
Width 650mm
Depth 650mm

Inlet Hose Length: 1100mm

Weight GW503/MW053/LW035

Packed 48Kg
Unpacked 43Kg

Capacity Max (Full Load) (AS 2040)

Dry Weight 5.0Kg

Water consumption per fill

High 63L
Medium high 56L
Medium 49L
Medium low 32L
Low 22L

GW603

52Kg
46Kg

6.0Kg

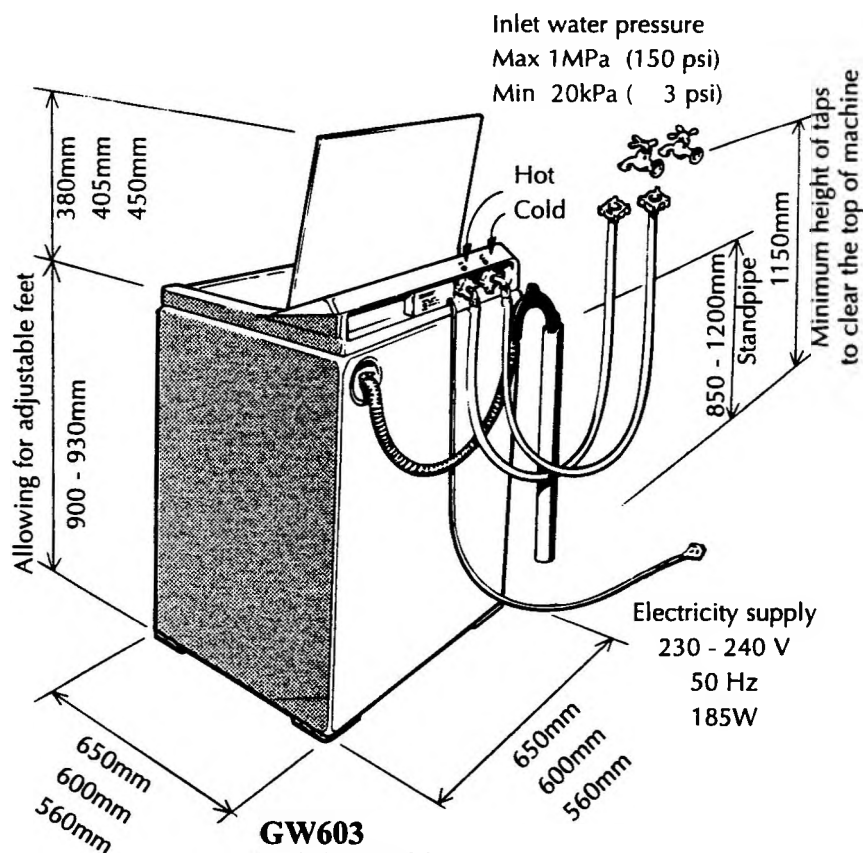
76L
68L
54L
39L
27L

GW703

57.5Kg
51Kg

7.0Kg

91L
76L
59L
45L
32L



Water fill temp (Factory Settings)

Hot	60°C
Hot/Warm	50°C
Warm	40°C
Warm/Cold	34°C

Cold as per supply temperature.

Recommended inlet hot water temperature not to exceed 65°C.

Wash Motor:

Electronically commutated direct drive

DC Motor

Motor Resistance per winding 6.1 ohms @ 20°C

Pump Motor 230V AC 50Hz (SELNI)

Thermal cutout fitted

Flow Rate 22 Ltrs per minute

Pump motor resistance 33 ohms

Water Valves

12 Volts DC Resistance 15 ohms

Cold Valve Proportional 15 ohms

Operating pressure - Max 1034 Kpa (150PSI)
Min 20 Kpa (3 PSI)

Inner Bowl Speed

Fast Spin 1,000 RPM

Medium Spin 700 RPM

Slow 300 RPM

Stir Speed 25 RPM

Fabric Softener Dispenser

Dosage 75cc

Electric Supply 230/240V AC 50Hz

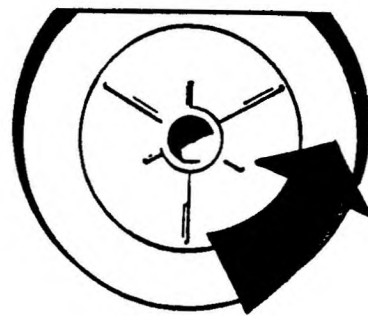
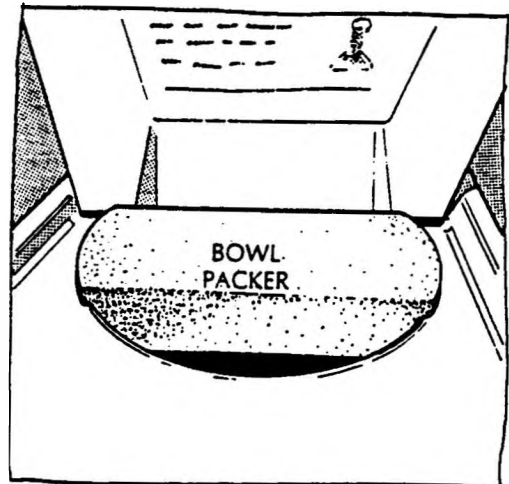
Max Current 2.8 amps

INSTALLATION

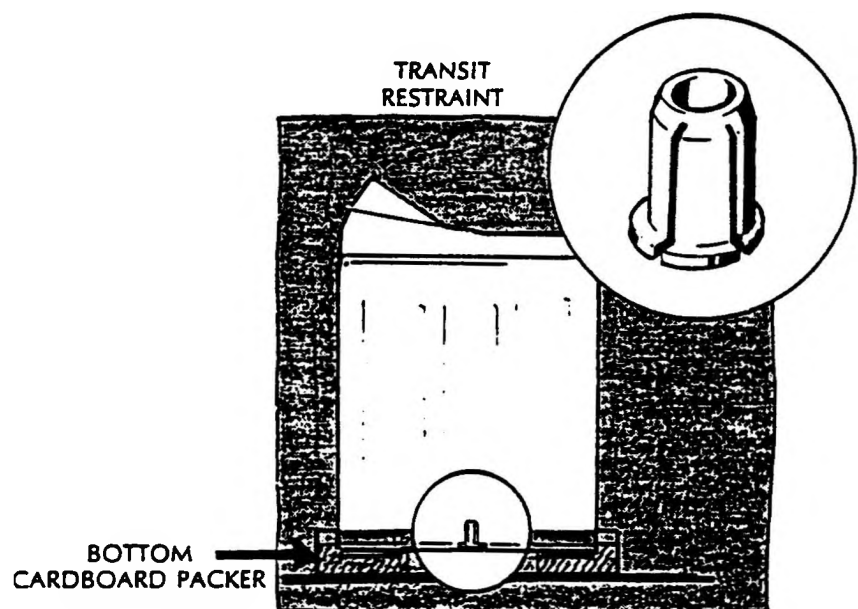
To ensure the best performance from this autowasher, please read the following instructions carefully.

UNPACKING

1. Having removed the outer packaging, leave the machine standing upright in the bottom cardboard packer.
2. Lift the lid and remove the bowl packer from the bowl.
3. Remove the hoses and accessories.
4. Rotate the agitator anti-clockwise for 3 revolutions to unscrew the transit restraint. (The wash bowl will then be able to move freely from side to side).
5. Flatten the bottom cardboard packer, remove the machine checking that the transit restraint has come away with the cardboard packer. Keep the bowl packer and transit restraint in case they are required for future transit.



ROTATE ANTI-CLOCKWISE



INSTALLATION

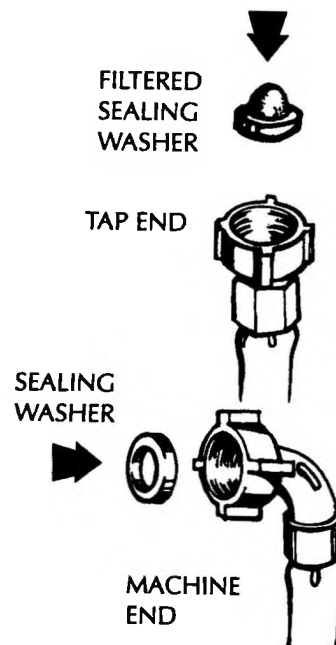
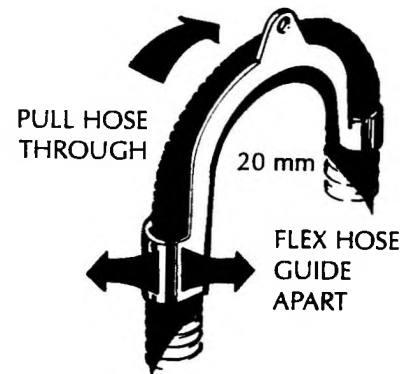
INSTALLING

1. Uncoil the power cord.
2. Remove the black ribbed drain hose from the fixture on the left hand side of the rear panel by carefully pulling the exposed part of the hose downwards and outwards.
3. Connect the drain hose to the tub or standpipe. The hose guide, included in the accessory kit, is to guide the hose over the tub or standpipe. The hose must not extend beyond the hose guide more than 20mm. If necessary the drain hose can be trimmed to length.
4. Place the filtered sealing washers (from the accessory kit) into the straight end of the plastic inlet hoses and connect to the taps.
5. Place the sealing washers (from the accessory kit) into the elbow ends of the plastic inlet hoses and connect to the machine inlet valves. The inlet valves are marked on the rear of the machine.

H = hot C = cold

Turn on the water and check the hose connections for leaks.

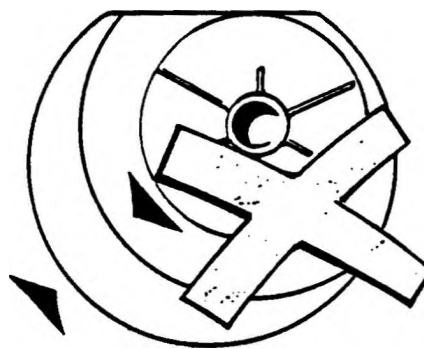
6. Move the machine into its final position. (We suggest a minimum clearance of 20mm either side of the machine for ease of installation). Make sure there are no kinks in the hoses.
7. It is **IMPORTANT** to level the machine. Adjust the levelling feet so that the stainless steel bowl sits in the bowl opening slightly forward of the centre.
8. Make sure the machine is firm on all levelling feet.
9. Plug the power cord into the wall socket.



LEVELLING MACHINE
Looking down on wash bowl



CORRECT ADJUSTMENT
Slightly forward of centre



INCORRECT ADJUSTMENT

INSTALLATION

HOT WATER TEMPERATURE

- * The hot water should not exceed 65°C (150°F). Water at excessively high temperatures will cause damage to the machine.
- * If there is an uncontrolled water heating source (e.g. wet back or solar heating system) you should fit a RMC (Reliance Manufacturing Company) TV 75 Hot'n'Save Valve for 3/4" pipe, TV50 for 1/2" pipe. Also available are adjustable RMC valves - TV75A and TV50A. This will ensure the hot water temperature remains within safe limits.
- * Consult a plumber or electrician if you are unable to adjust the water temperature yourself.

DRAINING

- * Draining must comply with local by-laws.
- * In multi-storey apartments or an upper floor, the machine should be installed on a drained floor.

ACCESSORIES AND SPARE PARTS

Available from a Fisher & Paykel Dealer or Authorised Service Centre.

Extra Long Inlet Hoses (2m)
Drain Hose Extension (1m)

Part No. 422680
Part No. 425627P

Power Cord If the power cord of the autowasher is damaged, it must be replaced by a special cord.

Part No. 425332

CAUTION

**ALL TERMINALS AND INTERNAL PARTS SHOULD BE
TREATED AS LIVE.**

**ALL SERVICING SHOULD BE CARRIED OUT WITH THE
MACHINE DISCONNECTED FROM
THE POWER SUPPLY.**

Unlike our previous electronic autowasher where the voltages
in the Console area were only 24V this autowasher has
230V AC voltages on ALL terminals.

ELECTRONIC SERVICE AND DIAGNOSTIC SECTION

5.0 INTRODUCTION

This section of the manual should answer most of the basic questions on the electronic operating principles and features of the autowasher.

IF A FAILURE OCCURS

If a fault condition has occurred with a machine, first remove the mains plug from the wall socket for at least 15 seconds, then insert it again.

It should be noted that a rapid interruption in the supply voltage could cause the microprocessor to assume a fault is evident and close down, indicating a fault code. To cancel out this condition, the power supply to the machine must be isolated and left for 15 seconds.

Operate the machine in the mode in which the failure occurred and if the condition recurs, repair by parts replacement as described below.

Most failures in operation are diagnosed by the console microprocessor which shuts down the operation and displays a fault code on the CYCLE PROGRESS LED's while continuously beeping.

5.1 ELECTRONICS SYSTEMS

The autowasher electronics consists of 4 mains parts:

a) Motor, (b) Motor Controller Module, (c) Display Module and (d) Rotor Position Sensor

The names of each part gives some idea as to their function.

These parts are shown in the block diagram Fig.1.

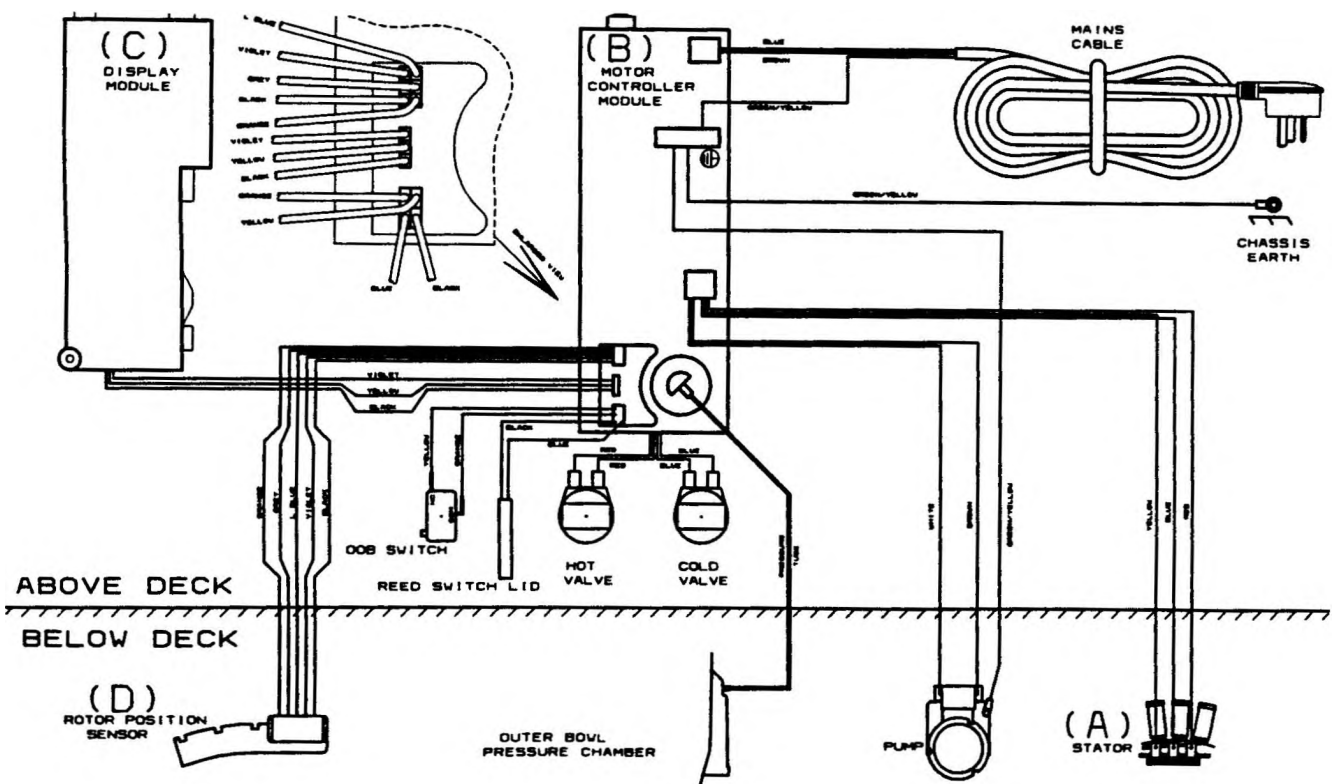


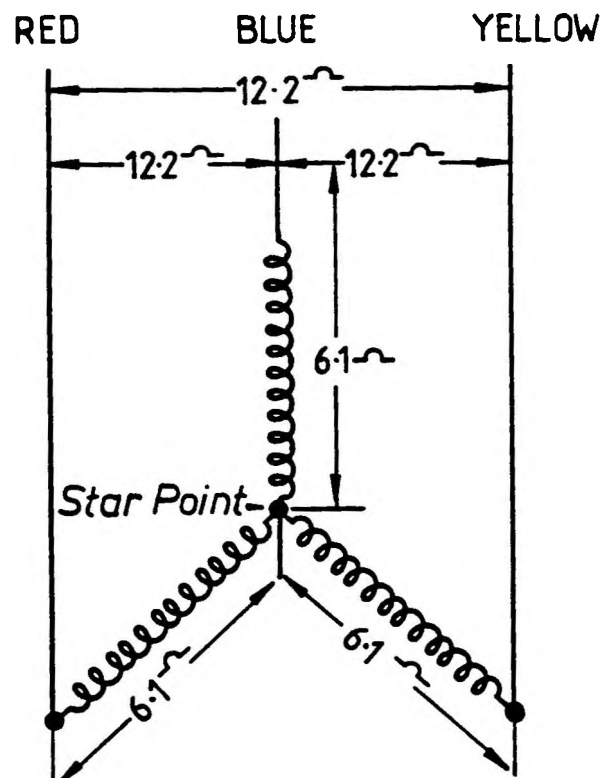
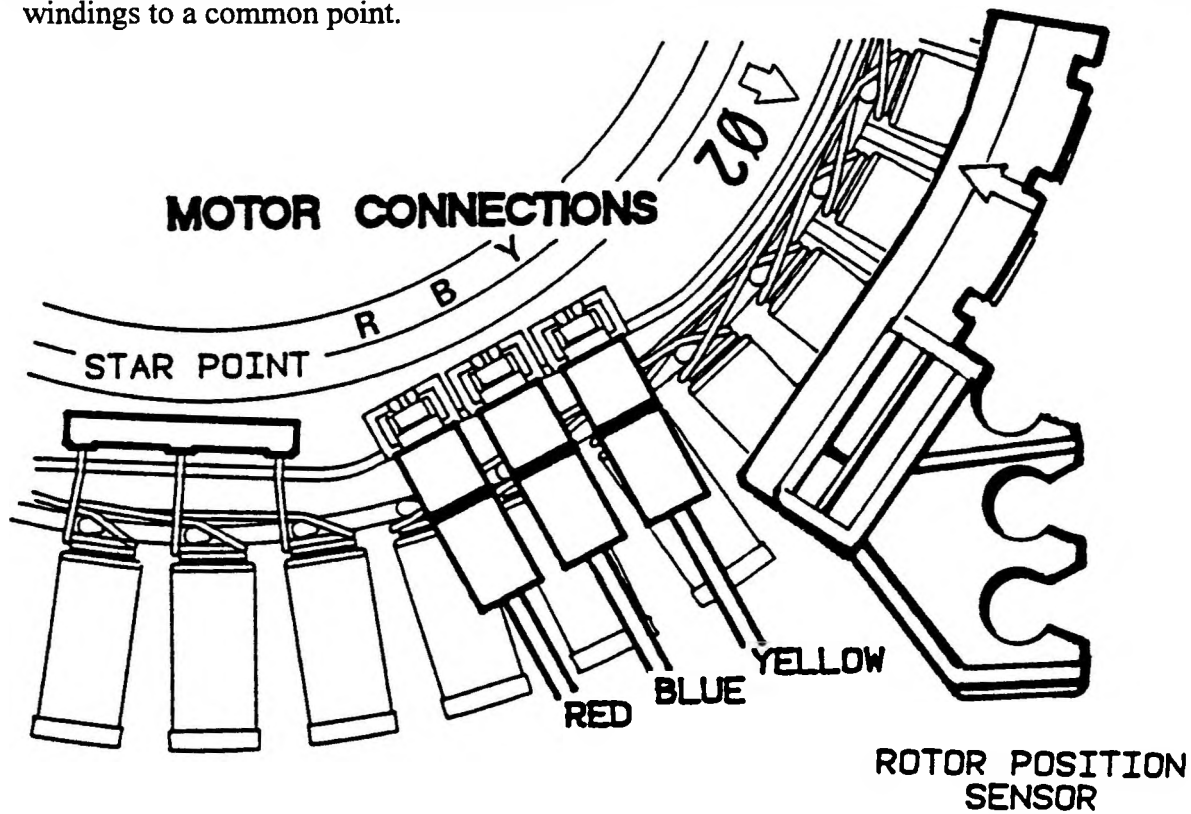
FIG.1. ELECTRONICS BLOCK DIAGRAM

5.1.1 Motor

The motor is a 3 phase, 42 pole, DC brushless motor. As there are no brushes, commutation is achieved electronically. The Motor Controller Module contains 6 electronic switches. A microprocessor turns these switches on or off in a particular sequence to control the position of the rotor.

The Motor consists of a STATOR (stationary part) and ROTOR (rotating part).

The STATOR has a 'star point' connection, and motor terminals. The Star point connects the 3 windings to a common point.



5.1.2 Motor Controller Module

This module contains the circuits needed to control the water valves, pump and rotation of the motor. It also accepts the signals from the rotor position sensor, pressure sensor and display modules.

A signal is sent from the Display Module to the Motor Controller Module indicating the type of action needed i.e. stir, agitate, spin, stop, etc. The microprocessor in the Motor Controller Module controls the electronic switches to rotate the motor in the desired manner.

The Motor Controller Module and Display Module are continuously monitoring each other, passing information back and forth on the required wash actions and diagnostic data. The Motor Controller Module also supplies the Display Module with the Low Voltages needed to operate.

The two Modules are connected together with one 3 way harness.

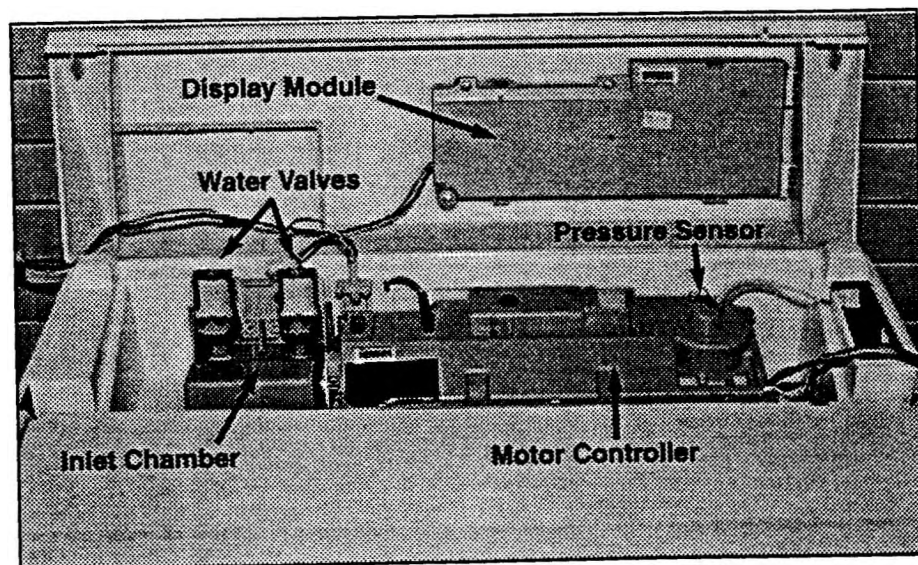
The electronics in the Motor Controller Module are cooled by water. The inlet chamber is a separate part to the Motor Controller Module. The inlet chamber serves two purposes;

- a) As a reservoir for the cooling water. During the fill cycles, water is flowing through the chamber continuously and cooling the electronics. However, during the spin cycles we need to keep a quantity of water in the chamber to cool the electronics.

Note: Should the electronics become too hot, the cold valve will be turned on to purge the chamber of hot water. Therefore, a small quantity of water may be discharged into the bowl during the cycle. This is normal and should not be seen as a fault.

- b) To mix the incoming hot and cold water. This is part of the automatic wash water temperature system. For this to work effectively the incoming water has to be mixed before entering the Motor Controller Module. A thermistor within the Motor Controller measures water temperature and enables the water temperature to be controlled.

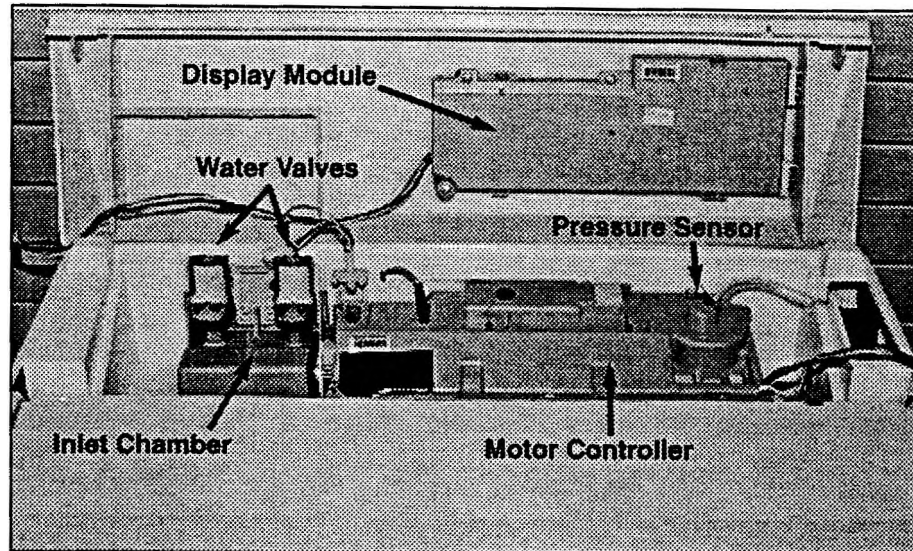
The Motor Controller Module contains a special type of memory device called an EEPROM. This type of memory allows us to store information on the machine operation, faults and diagnostic information. The last fault information is retained in the memory. It will only be overwritten if another fault occurs or when the machine has successfully completed 1 full cycle, then the fault code will automatically be CLEARED from the diagnostic display. This memory is also used to store the Favourite Cycle Data, Optional Adjustments Mode Data (see later) as well as special data stored during manufacture. All this memory will be retained even when the machine is disconnected from the mains power supply.



5.1.3 Display Module

The Display Module contains a second microprocessor. The function of this unit is to take the inputs from the front panel (i.e. user settings) and lid switch, then calculate the appropriate command to send to the Motor Controller Module.

It also controls the output to the display LED's and beeper.



5.1.4 Pressure Sensor

Conventional pressure switches consist of a number of mechanical contacts. When the correct water level is reached, one of these contacts changes over. When the contacts change a clicking sound is heard. Only at this point will the microprocessor know that a particular water level has been reached and then take the appropriate action.

This autowasher is fitted with a pressure sensor. It does not contain switch contacts, but an electronic circuit that can measure the water level throughout the fill process. Hence, the machine can fill to any water level and apply the appropriate wash actions for best results.

The pressure sensor is incorporated within the Motor Controller Module and cannot be removed.

5.1.5 Water Valves

The autowasher is fitted with an automatic water temperature fill system. The electronics control the water valves so that a constant water temperature is achieved in the bowl irrespective of the temperatures and pressures of the household hot and cold water systems. This system will also compensate for changes in pressure and temperature during the machine fill cycle. If a shower, toilet or other water using device is used while the autowasher is filling, the system will control the water valves so that a constant bowl water temperature is maintained.

To achieve this result, a special water valve has been developed. This valve is called a proportional water valve. Unlike conventional water valves which are either fully on or fully off, the proportional water valve can be controlled so that it can turn on at any water flow rate between fully on and fully off. The proportional water valve is used to control the cold water. The hot water is controlled by using a conventional type of water valve.

It is important that the correct water valve is fitted should they ever need replacement. The valves can be identified by the following features:

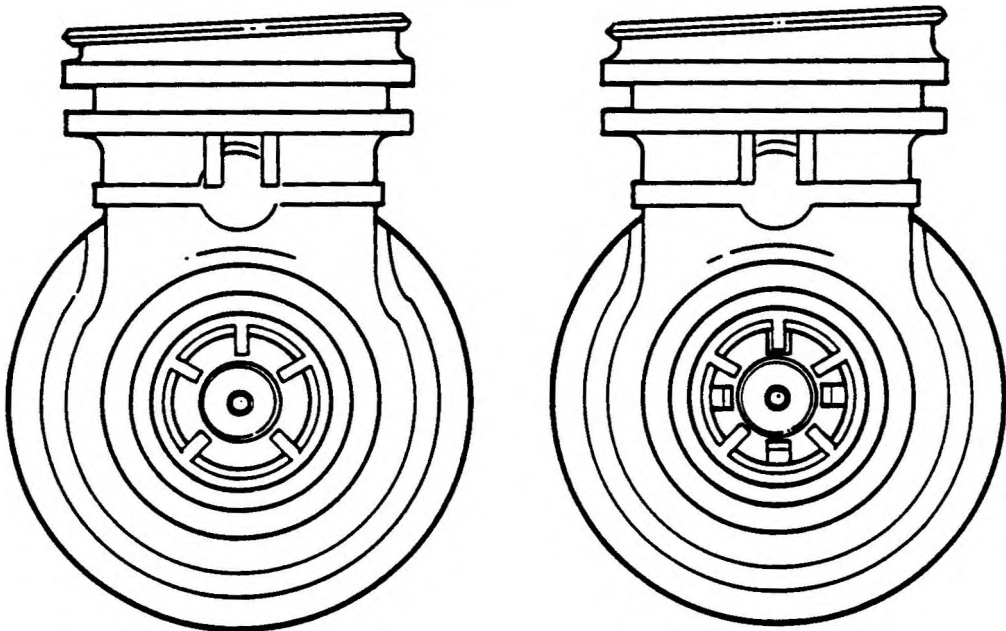
Proportional Valve		Standard Valve	
a	Filter colour White	Red	
b/	Shape of water valve plunger Has no stand offs	Has four stand offs visible from outlet nozzle	
			

FIG 3. Difference between Proportional and Standard Valve

5.1.6 Rotor Position Sensor

One of the inputs that the Motor Controller Module needs in order to determine which switches to turn on, is the position of the Rotor. This information is supplied by the Rotor Position Sensor.

On the Rotor Position Sensor circuit board there are three devices called Hall Sensors. These detect the magnetic field of the individual magnets in the Rotor. As the motor turns, the position of a group of magnets is detected. There are 5 wires on the Rotor Position Sensor, 2 for power supply and 3 signal wires. Data on the position of the Rotor is supplied to the microprocessor in the Motor Controller Module via the three signal wires.

The Rotor Position Sensor is static sensitive. ESD precautions must be taken when handling this device.

To check the Rotor Position Sensor use a RPS tester part number 502105.

5.2 MECHANICAL SYSTEM

Two new features on the autowasher have significantly reduced the number of parts in the machine. These are the DIRECT DRIVE motor and the FLOATING BOWL SYSTEM.

5.2.1. Direct Drive

The DIRECT DRIVE motor has eliminated the need for pulleys and belts used in our previous product, or gearboxes and other electro-mechanical items used in older designs.

The Rotor is connected via a single shaft to the agitator. The single shaft design also eliminates the need for extra seals which are needed in conventional multi shaft designs.

5.2.2 Floating Bowl

During spin, the agitator and inner bowl have to be coupled together and turn as a single unit, while in agitate the agitator and inner bowl have to be free to rotate independently. This action is normally achieved by using two concentric shafts running in bearings and seals to the drive mechanism on the bottom of the bowl. Clutches or electro-mechanical mechanisms couple or decouple the two parts. The two shafts method requires multiple seals and bearings.

In this autowasher the inner bowl is free to move in a vertical direction. The position of the inner bowl is determined by the water level. At the base of the inner bowl is a flotation chamber consisting of a number of individual cells. When the washing machine is filling with water the pressure on the air in these cells increases as the water level rises until eventually the inner bowl floats upwards and disengages the driven spline from the drive spline. This action frees the agitator from the inner bowl and allows it to move freely in both directions.

When the water is draining from the washing machine the pressure on the air trapped in the cells of the flotation chamber decreases allowing the inner bowl to settle back down onto the drive spline and re-engage the driven spline thus allowing the agitator and inner bowl to turn as one unit.

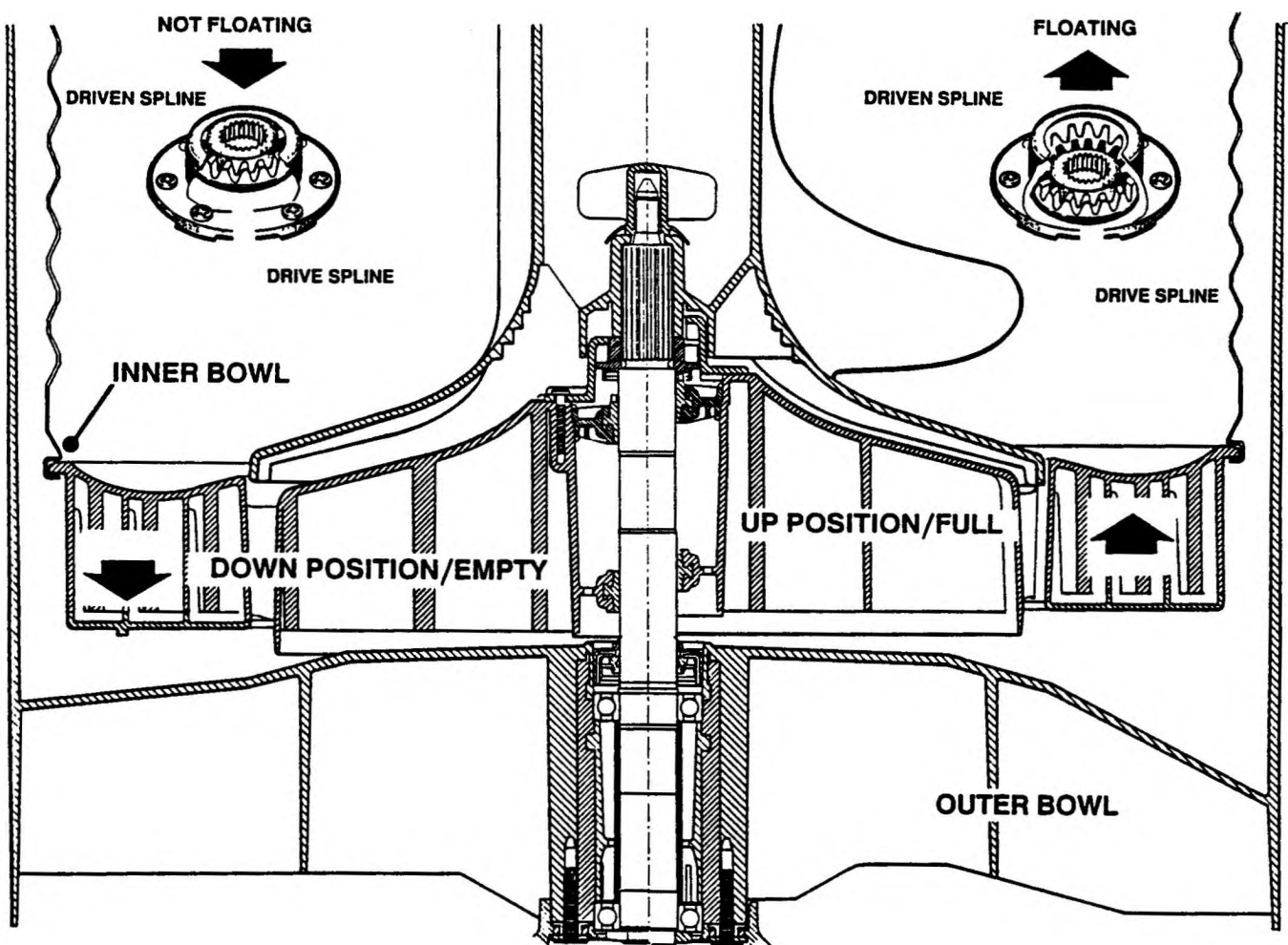


FIG.4. Floating Bowl

The floating bowl is also used to detect if the user has selected the correct water level for the size of the clothes load in the machine.

The point at which the bowl starts to float is determined by the water level and the size of the load. The greater the load, the more water is needed before the inner bowl will float. By detecting the point at which the bowl floats, the microprocessor can determine whether the correct water level for the particular clothes load has been chosen by the operator. If the operator has chosen a level that is too low for the load, the machine will override that choice and fill to the correct level. This is to ensure optimum wash performance and minimal clothes wear. If the operator has chosen a level that is higher than necessary, the machine will still fill to the operator's chosen level.

Detection Of Inner Bowl Float Off Point

During fill the inner bowl will rotate to ensure that the clothes are evenly saturated with water. When the chosen water level is reached, and before the agitate cycle is started, the machine will carry out inner bowl float checks. The inner bowl will stop and commence a number of small agitate type actions. During this action the machine determines if the inner bowl has floated. If it has, the microprocessor will determine the required water level and check if the operator has selected the correct level. If the inner bowl has not floated off, the machine will continue filling and check again later.

Note: The water level at which the inner bowl floats off is not necessarily the same as the final water level.

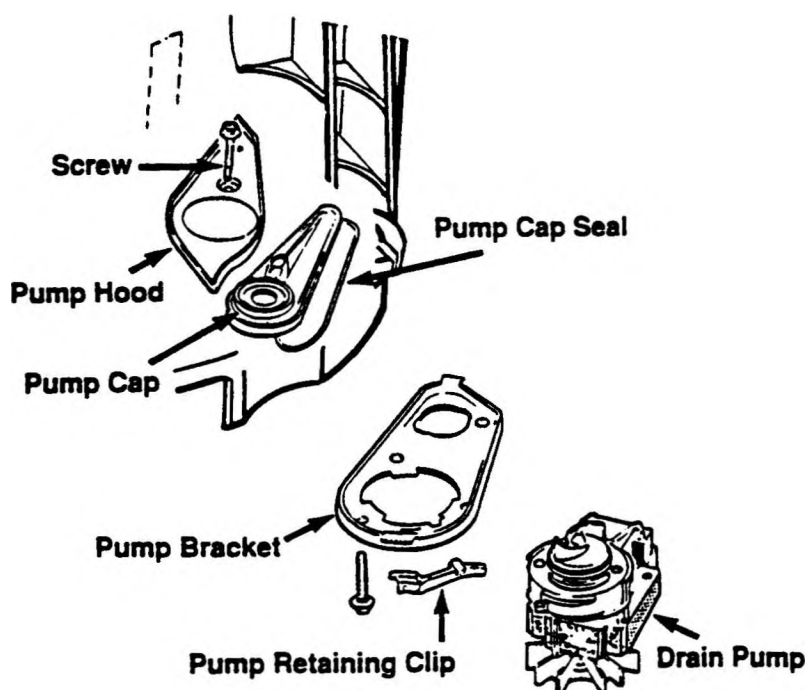
Detection of Inner Bowl Re-Engagement

After the machine has pumped out the water, the inner bowl will sink down and re-engage onto the drive spline. To ensure the inner bowl has re-engaged correctly, the machine will carry out a bowl re-engage test sequence.

This test consists of a series of short agitate type actions before the spin cycle starts. A sound may be heard as the inner bowl re-engages.

5.2.3 Drain Pump

The drain pump motor is coupled directly to the base of the outer bowl. This eliminates bowl to pump hoses and the accompanying seals, clips etc. The pump housing is an integral part of the outer bowl. The pump is accessible by removing the inspection hatch on the front of the machine. It is also accessible for cleaning from the top by removing the agitator and inner bowl.



5.2.4 Lid Switch

If the lid is raised, the lid switch operates and stops the cycle when :

1. The machine is stirring during fill.
2. The machine is spinning. (The machine brakes to a halt within a specified time).

NOTES:

- ☒ The user may lift the lid during agitate phase to add clothes or watch the wash action. However, the machine will brake if this is tried during spray rinse or final spin, or stop during fill. It is advisable not to lift the lid during the spin cycle.
- ☒ The machine should turn off when the lid is opened 50mm and restart at least 12mm before the lid is closed.
- ☒ The lid switch is controlled by a reed switch located under the top deck on the right hand side towards the front. The reed switch is activated by a magnet which is moulded into the lid assembly.

5.2.5 Lint Removal System

The self-cleaning lint removal system works by continuous water circulation, resulting in the separation of lint from the wash water.

As a result of the agitator action, lint and wash water are sucked into the agitator stem and down to the base, where they are directed into the cavity between the inner and outer bowls. The extruded holes of the inner bowl are shaped to allow the wash water to flow back into the bowl, but prevent the lint from following.

The lint then floats to the surface of the water, between the inner and outer bowls and remains there until it is flushed out the drain at the end of the wash cycle. In the spin mode, water spun from the clothes through the small holes in the bowl flushes the lint off the outer bowl and down the drain.

The advantage of the self-cleaning system is that lint removal becomes completely automatic. The user no longer has to clean lint filters after every wash. The self-cleaning lint removal system has proved to be effective and efficient.

6.0 OPTION ADJUSTMENT MODE

The autowasher can be adjusted to operate under a number of different conditions.

To meet some of these conditions, a feature has been included which allows some of the functions to be changed to suit individual needs. This is called the OPTION ADJUSTMENT MODE.

The features that can be adjusted in this Mode are:

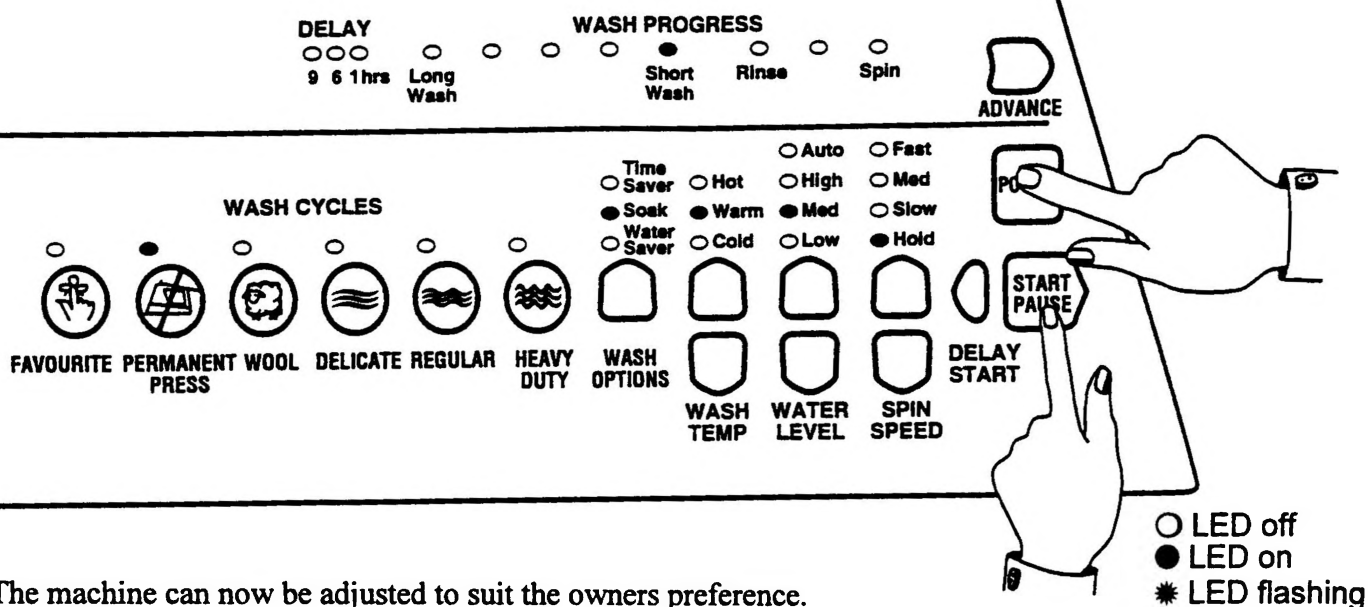
- a) Water Temperature
- b) Rinse Options
- c) Number of End of Cycle Warning Beeps
- d) Auto out of Balance Recovery
- e) Auto Water Level Adjustment
- f) Water saver Rinse Volume Adjustment

To Select the OPTION ADJUSTMENT MODE

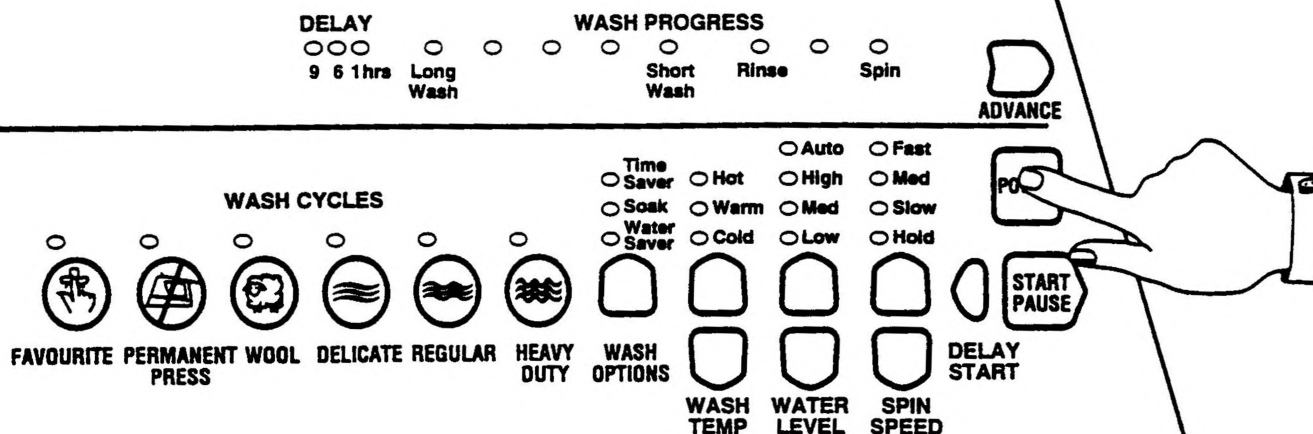
1. Press and hold the **START/PAUSE** button, then press the **POWER** button.

Two quick beeps will sound and the LEDs on the front panel will change.

The controls and LEDs on the front panel will now serve different functions from the normal wash functions.



2. The machine can now be adjusted to suit the owners preference.
3. To return the machine to Normal operation, press the **POWER** button or disconnect the mains power plug.



6.1.1 Wash Water Temperature

It is possible to adjust the water temperature of each of the wash temperature settings, i.e. Cold, Cold/Warm, Warm, Warm/Hot, Hot.

NOTES

1. Do not use the household water taps or water heater controls to vary the wash temperature. The automatic water temperature control system fitted will compensate for variations in household water temperature and pressure. Adjusting the water pressure or water flow with the household taps, or adjusting the water heater temperature, WILL NOT alter the wash temperature. The method described below is the only method by which the water temperature can be altered.
2. If the machine is used in an installation where only a cold water supply is available, then the cold temperature range must be selected and the "cold water only" setting must be chosen in the option adjustment mode. Refer Table 2.

If the temperature is set at any other level, the machine will expect hot water when filling the machine. As it will not detect any hot water, it will eventually display the *USER FAULT that there is no hot water.

* Refer USER FAULT section 8.5.

3. We recommend that the hot water temperature setting on the household water heater does not exceed 65°C. for personal safety and machine reliability.

Method of Setting the Wash Temperature

1. Select the OPTION ADJUSTMENT MODE by pressing and holding the **START/PAUSE** button, then pressing the **POWER** button.
2. Use **WASH TEMPERATURE** buttons and LEDs to select the temperature setting to be adjusted, i.e. Cold, Cold/Warm, Warm, Warm/Hot, Hot.
3. Use the **ADVANCE** button and **WASH PROGRESS** LEDs to increase or decrease the temperature.

Each time the **ADVANCE** button is pressed, the **WASH PROGRESS** LEDs will advance one position to the right. This increases the temperature by approximately 1°C. When the spin LED is on and the **ADVANCE** button is pressed, the spin LED will go off and the left hand (long wash) LED will turn on. This is the coldest setting. The setting can then be advanced through again to achieve the required temperature. (See Table 2 for the approximate temperature for each of the 5 temperature ranges)

4. Select the next temperature range to be changed with the **WASH TEMPERATURE** button.

Repeat Step 3.

Each Temperature range can be adjusted using this method.

5. To return the machine to Normal operation, press the **POWER** button.

Water Temperature Settings

Approximate Temperature Range	15 min Long Wash LED on	12 min Wash LED on	9 min Wash LED on	6 min Wash LED on	3 min Short Wash LED on	Rinse LED on	Final Rinse LED on	Spin LED on
Hot	55	56	57	58	59	<u>60</u>	61	62
Warm/Hot	46	47	48	49	<u>50</u>	51	52	53
Warm	36	37	38	39	<u>40</u>	41	42	43
Cold/Warm	31	32	33	34	<u>35</u>	36	37	38
Cold	<u>*C</u>	20	21	22	23	24	25	26

Table.2. Water Temperature Settings

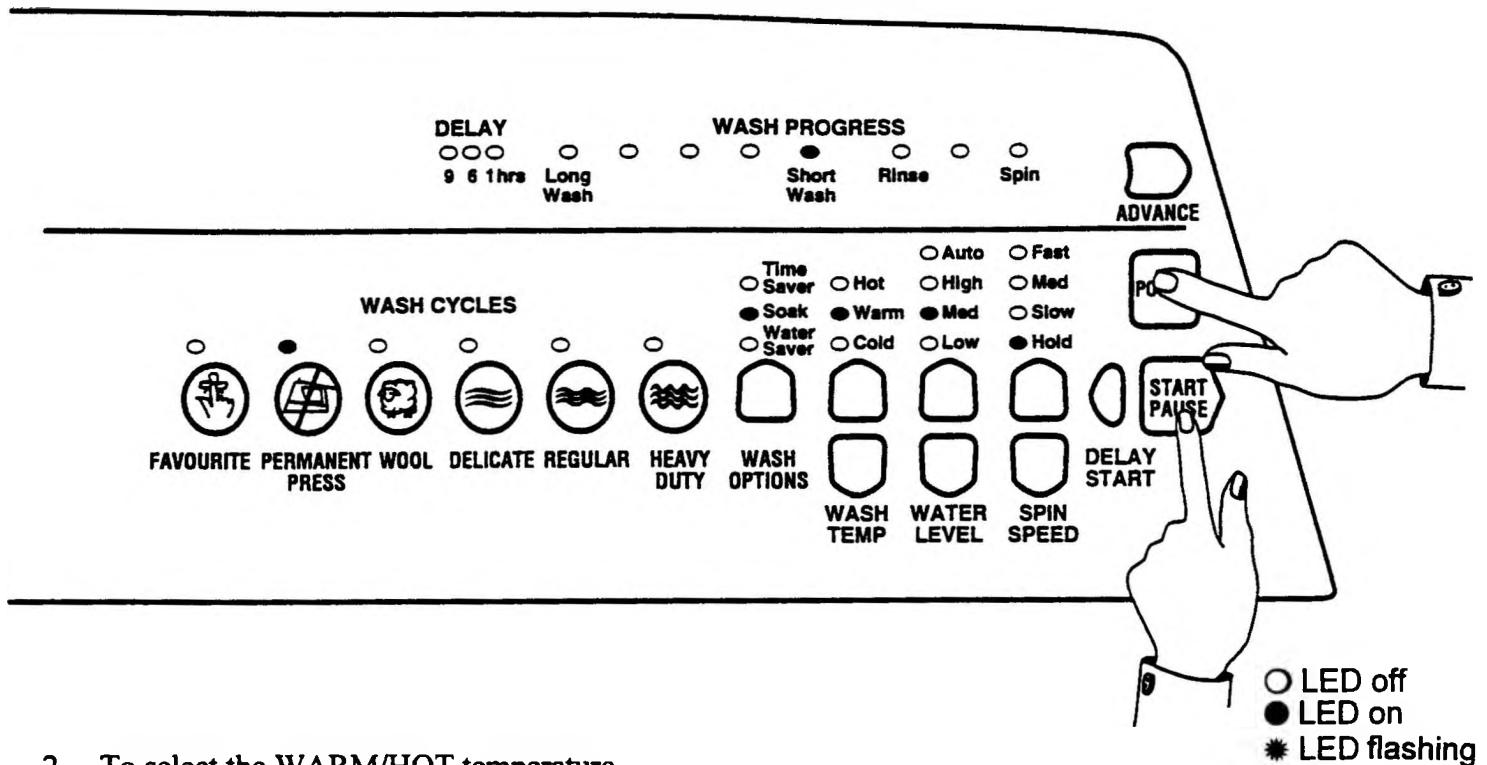
- *C** - Cold water only
- Underlined figures are the factory settings
- All temperatures are expressed in °C

Note: If the temperature of the cold water supply is above the setting, a cold water user warning will sound because the machine will be unable to control the water temperature down to the required temperature. Re-adjust cold temperature to cold only or a temperature that is above the cold water supply.

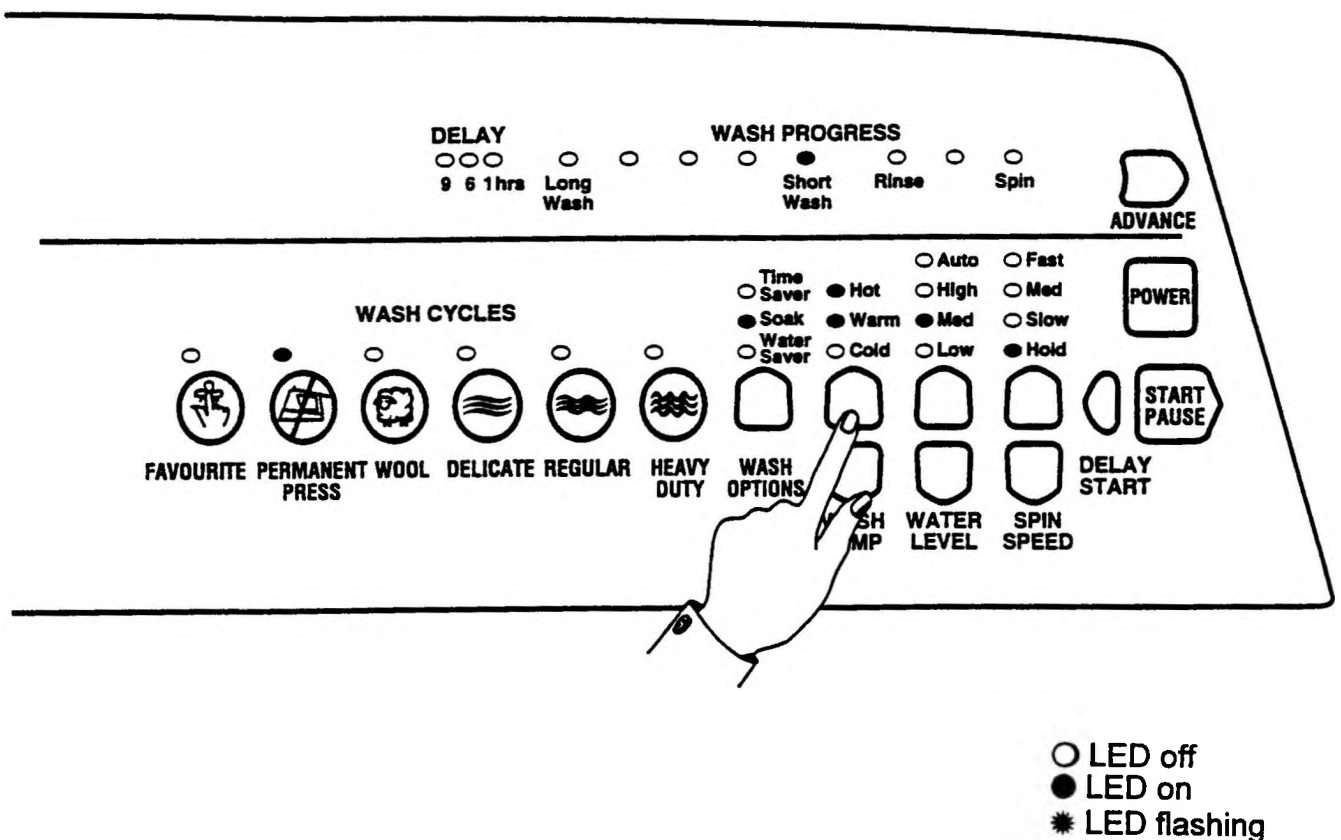
EXAMPLES OF ADJUSTING WASH TEMPERATURE

Adjust Warm/Hot temperature to 52°C.

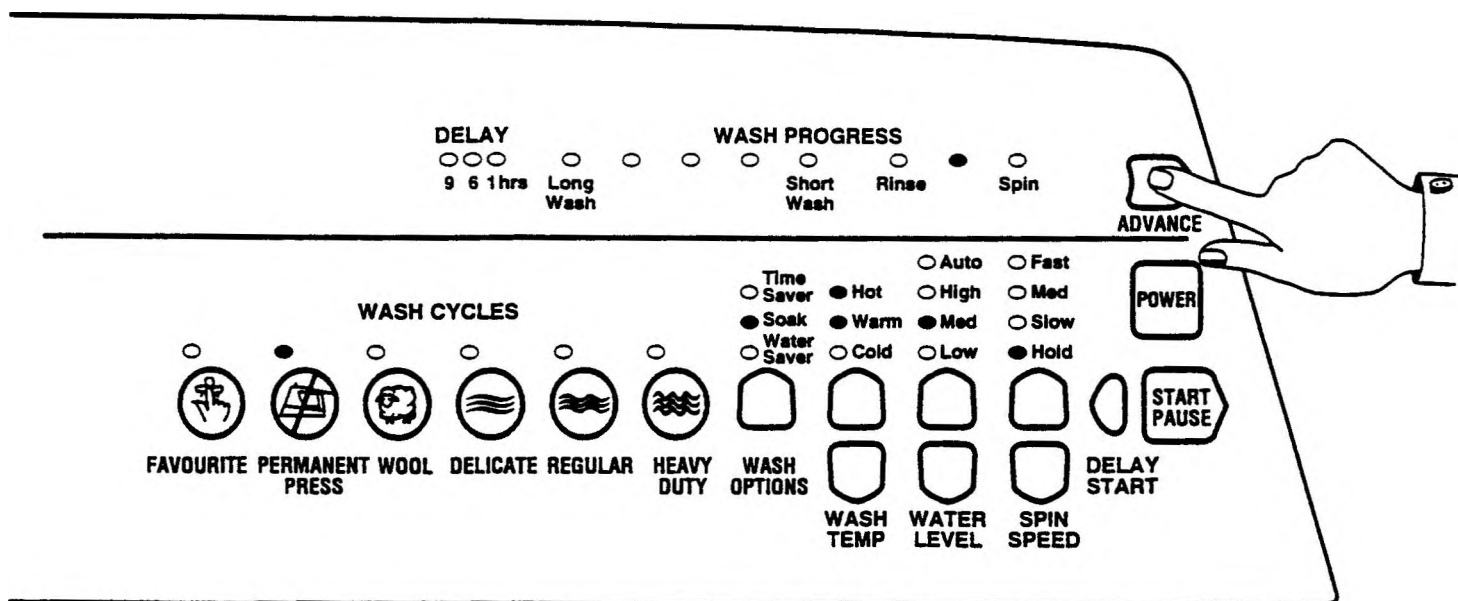
- To select the **OPTION ADJUSTMENT MODE**.
Press and hold the **START/PAUSE** button, then press the **POWER** button.



- To select the **WARM/HOT** temperature.
Press the **WASH TEMPERATURE UP** button once.

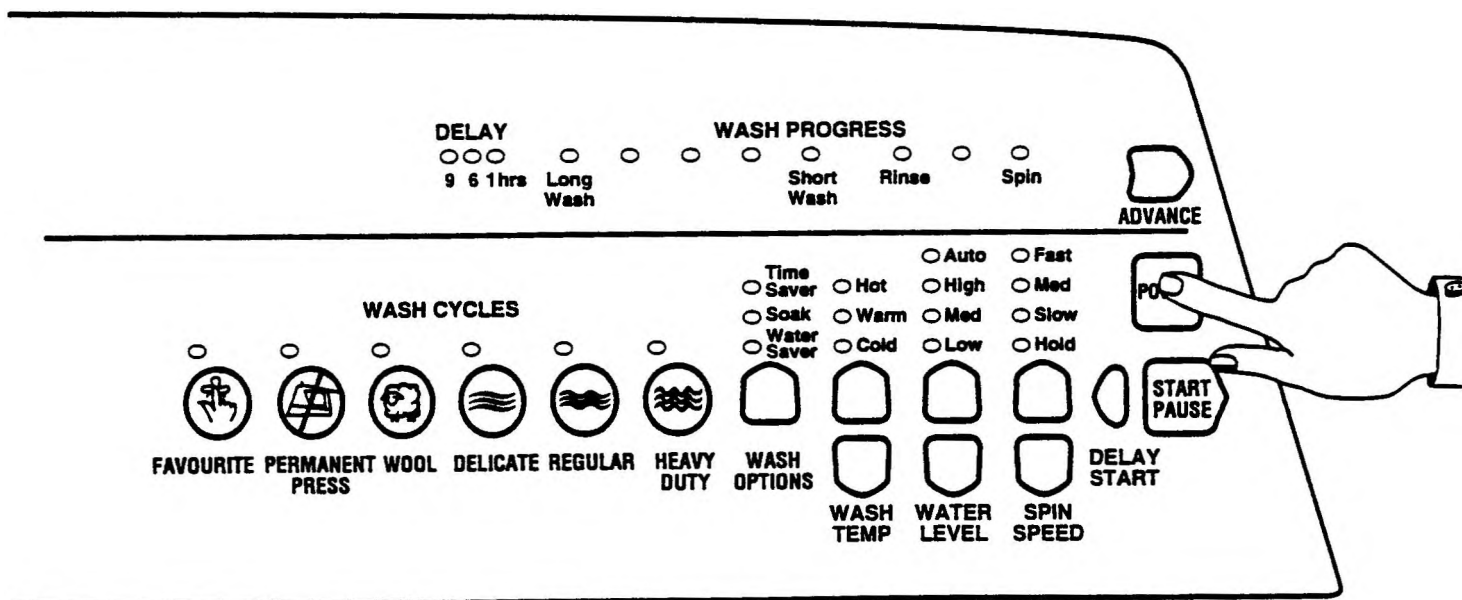


3. Press the **ADVANCE** button twice. The Final Rinse LED will be on. This is the 52°C LED as shown on Table 2 - refer section 6.1.1.



○ LED off
● LED on
* LED flashing

4. Press the **POWER** button to return to normal operation



○ LED off
● LED on
* LED flashing

6.1.2 Rinse Options

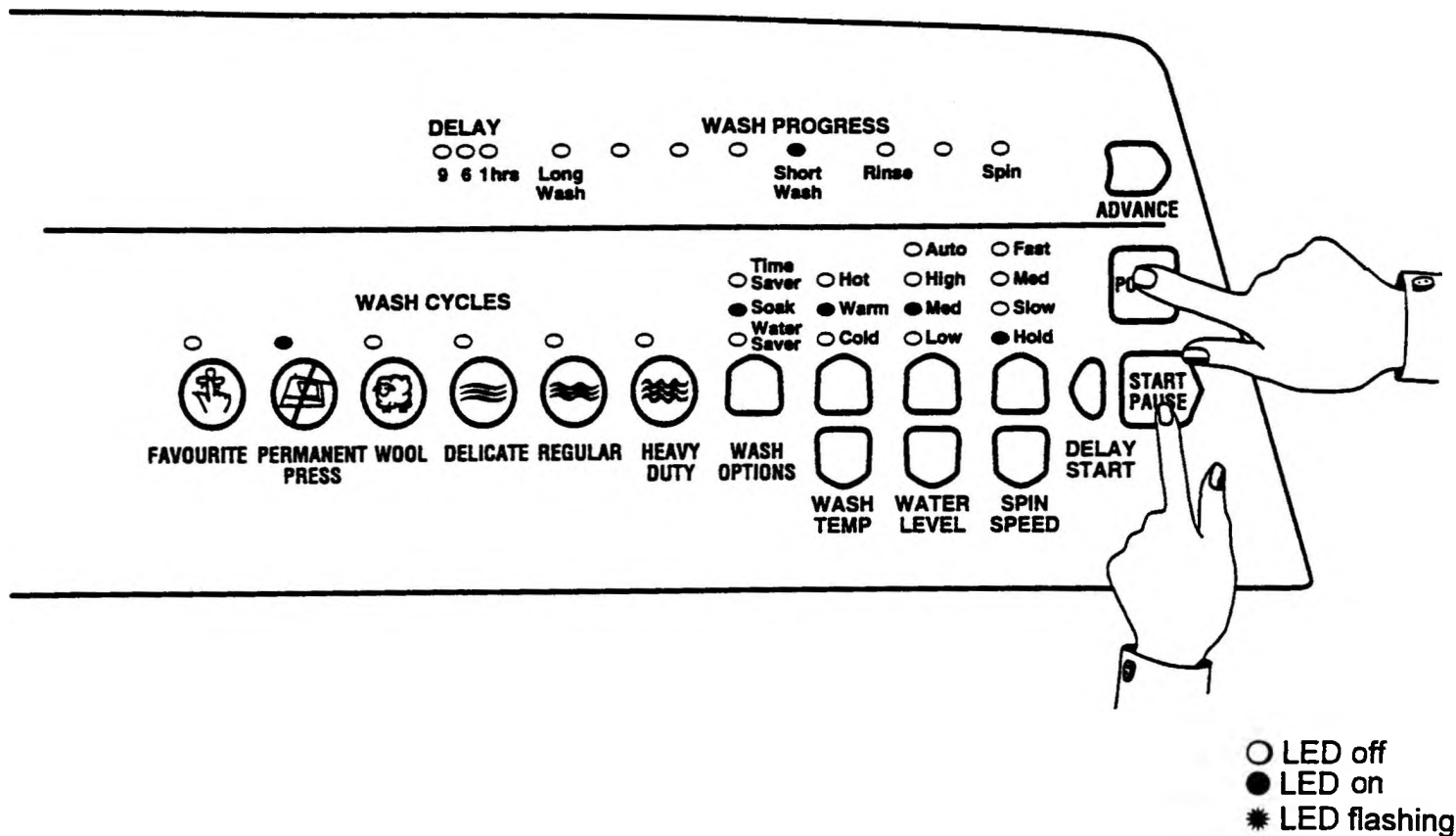
The autowasher may be used in a large number of different installations where the water supplies can vary. In some areas the water may be contaminated, in others areas the water supply may be limited. Also the user may have particular preferences as to the type of rinse they use. To cater for these variations the Rinse type can be changed.

	First Rinse	Comments
RINSE OPTION (i)	Spray Rinse	Factory Setting. Gives the best performance for suds removal and water usage.
In areas where the water supply contains solid contaminants, ie bores, the spray rinse action can result in these contaminants being deposited on the fabrics. In this case it would be better to use Option (ii) or (iii).		
RINSE OPTION (ii)	Spin only	Does not give as good a suds removal as Option (i) but uses less water than Option (iii)
RINSE OPTION (iii)	Deep Rinse	Gives better suds removal but increases water usage.

The first rinse is always followed by a final deep rinse and spin.

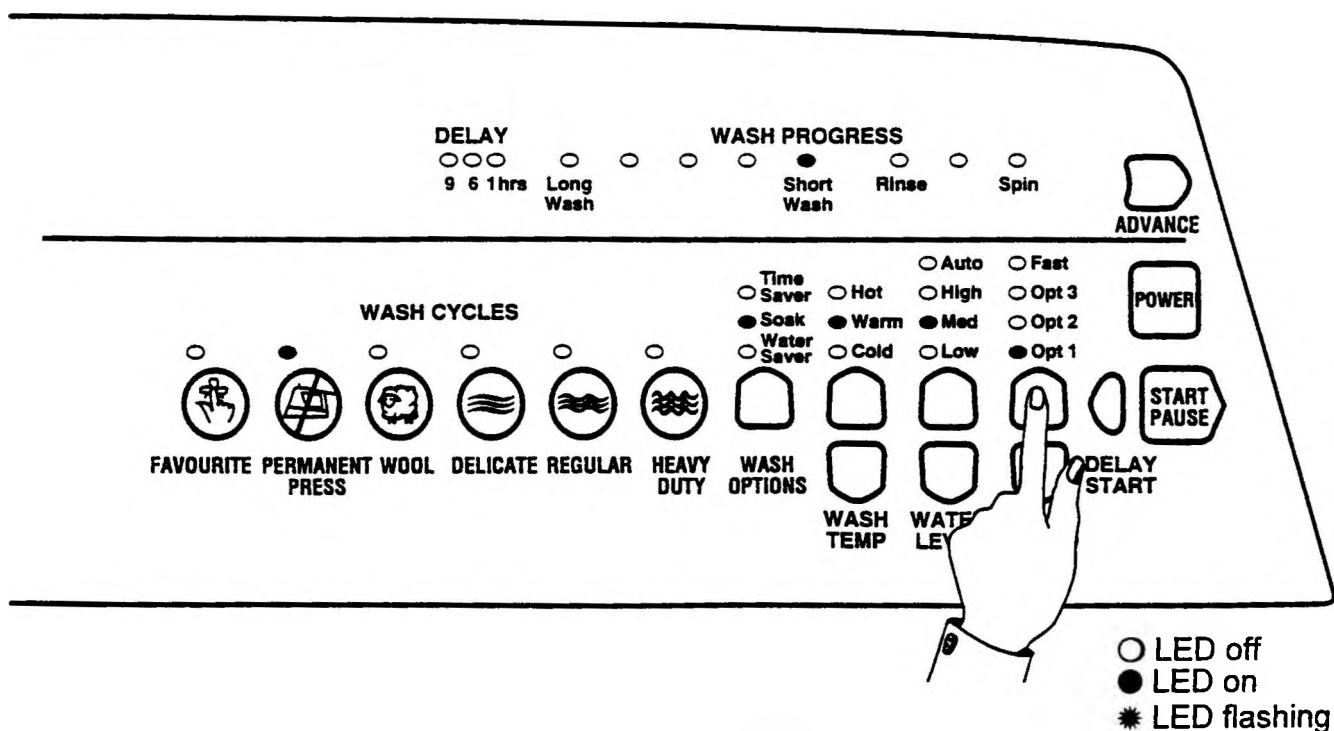
Method of selecting RINSE OPTIONS

1. Select the OPTION ADJUSTMENT MODE by pressing and holding the **START/PAUSE** button, then pressing the **POWER** button.

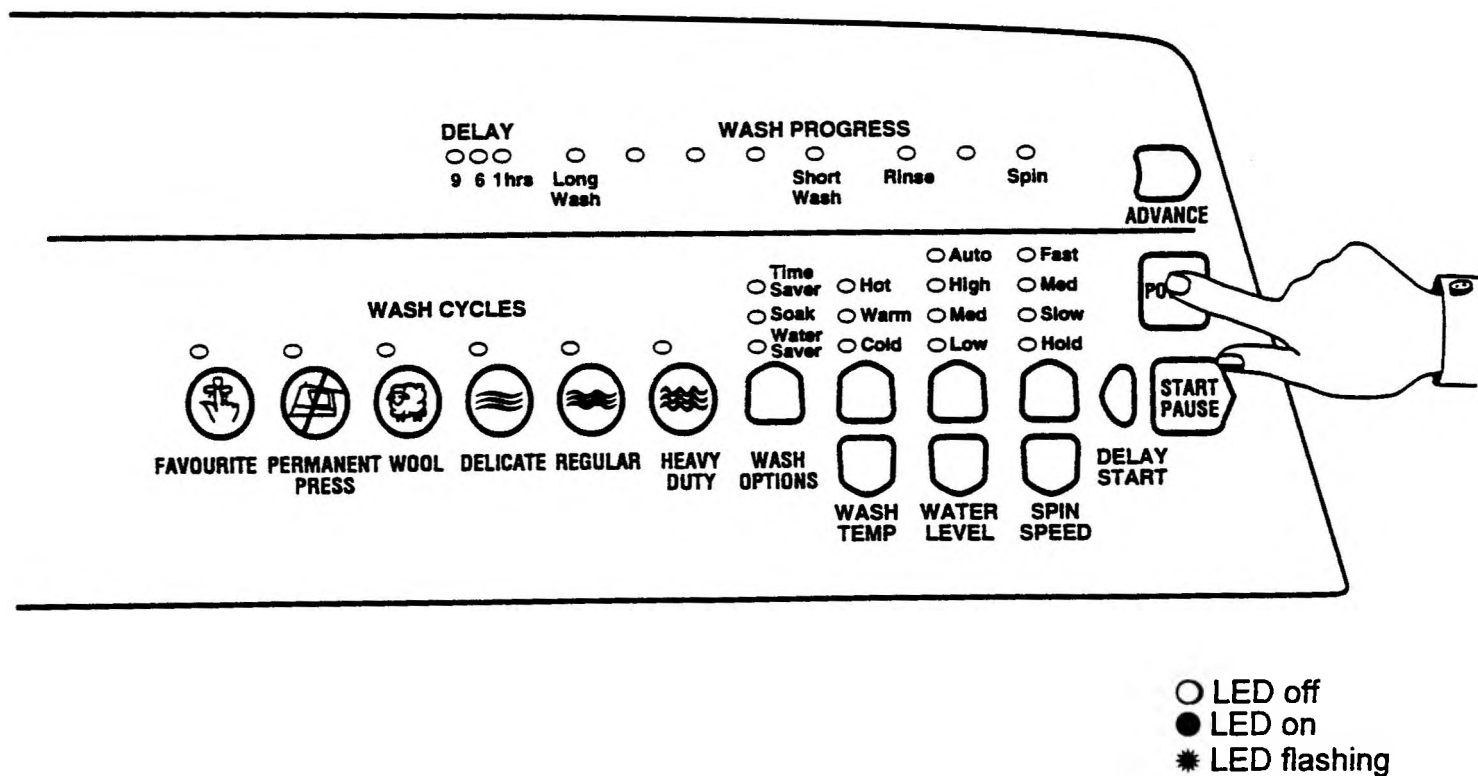


2. Press the **SPIN SPEED** buttons to select Rinse options.

Hold LED ON - OPTION (i)
 Slow LED ON - OPTION (ii)
 Med LED ON - OPTION (iii)



3. To return the machine to Normal operation, press the **POWER** button.

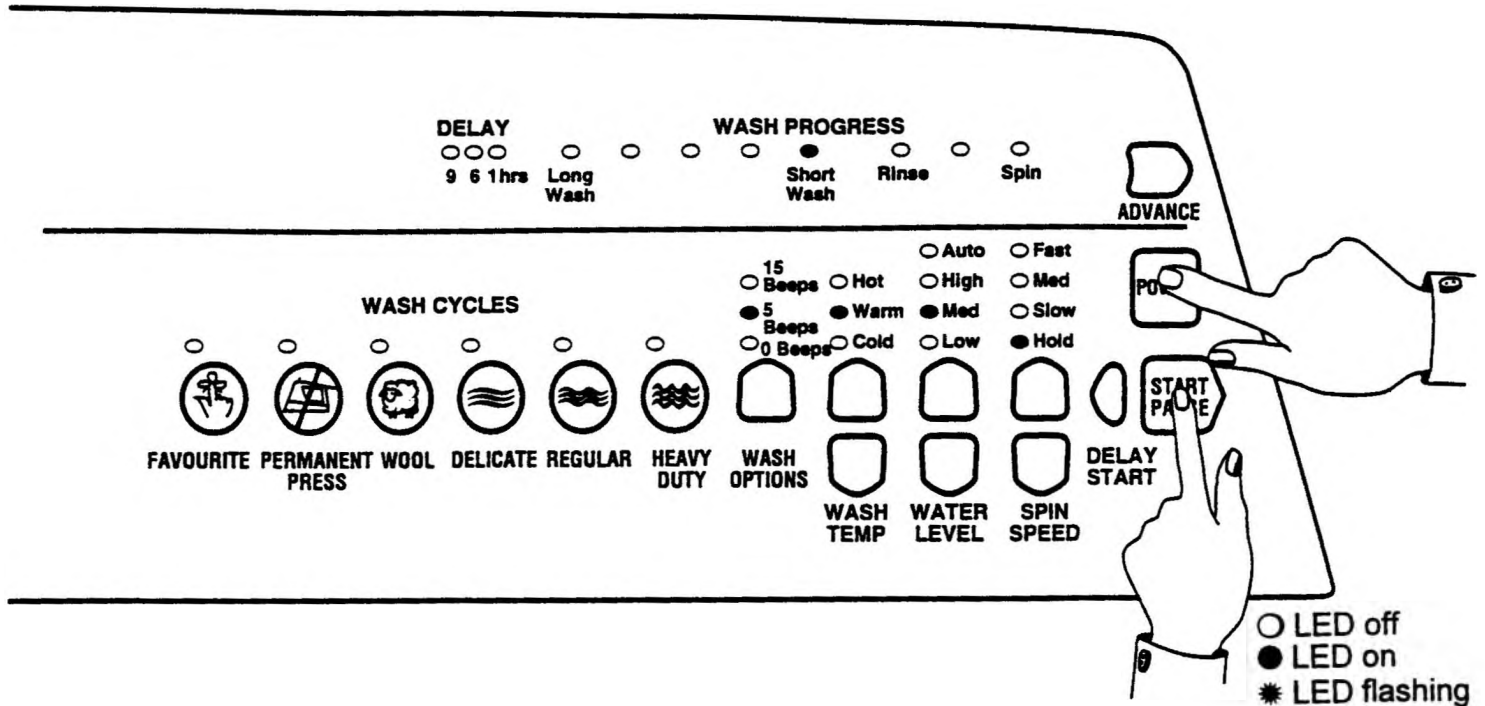


6.1.3 End of Cycle Warning Beeps

The autowasher finishes each cycle by sounding a series of warning beeps. These beeps are designed to be noticeable. In some circumstances, e.g. shift workers, new baby in the house, etc, the user may wish to increase the number of beeps or eliminate them altogether.

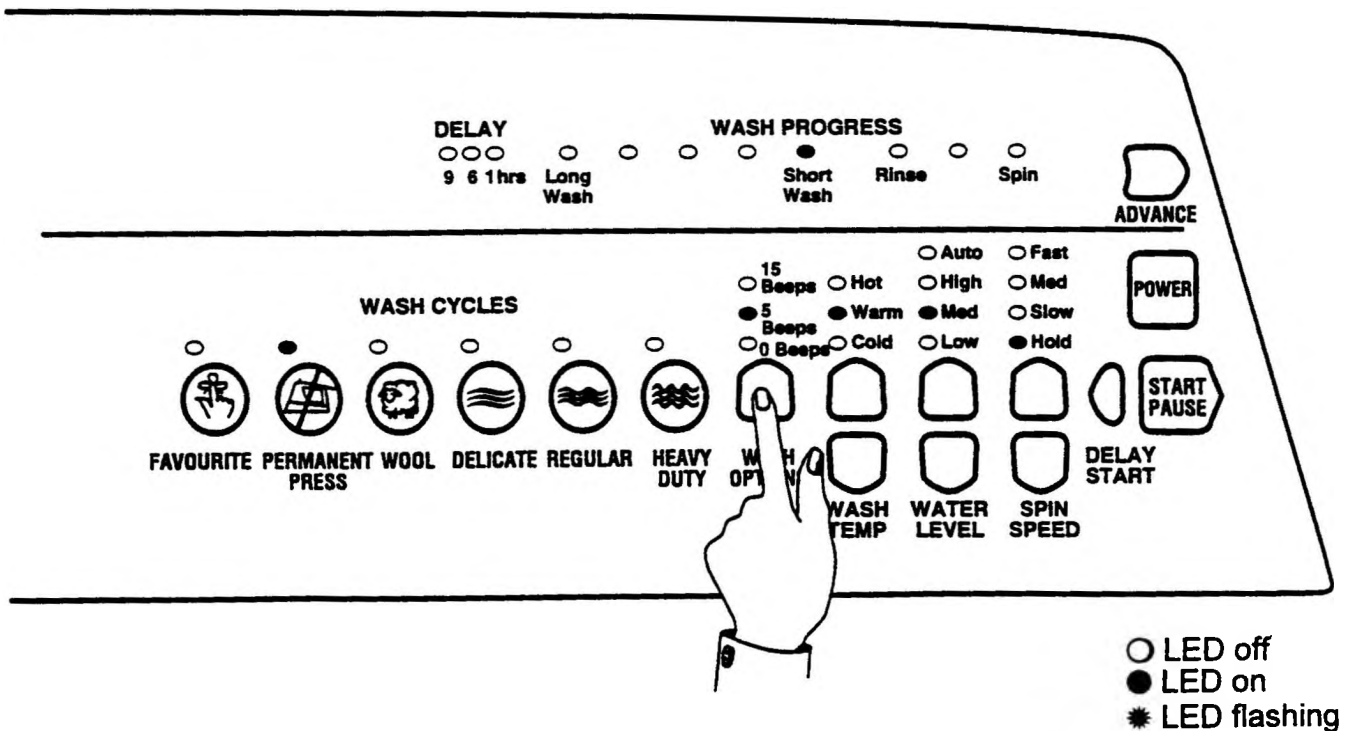
Method of adjusting the number of **END of CYCLE WARNING BEEPS**

1. Select the **OPTION ADJUSTMENT MODE** by pressing and holding the **START/PAUSE** button, then pressing the **POWER** button.

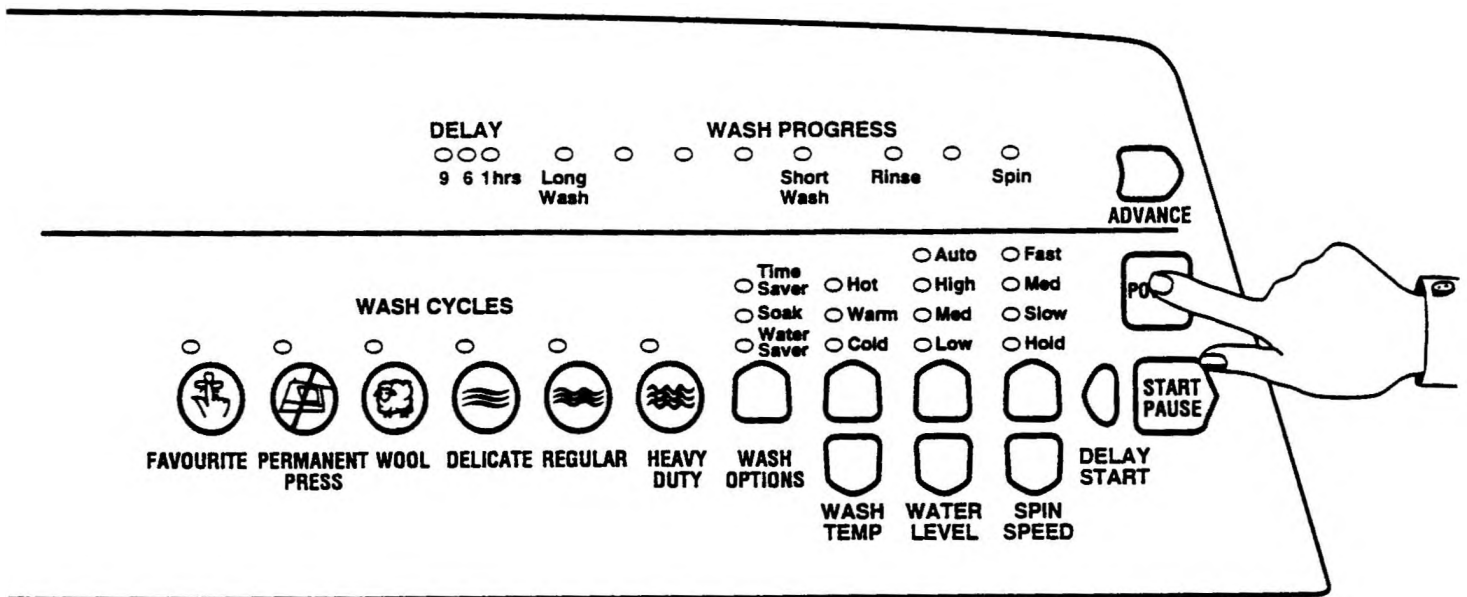


2. Use the **WASH OPTIONS** button and LEDs to select the required option. Pressing the **WASH OPTIONS** button will cause the LEDs to change.

- 15beeps - Time Saver LED on
- 5 beeps - (Factory Setting) Soak LED on
- 0 beeps - Water Saver LED on



3. To return the machine to Normal operation, press the **POWER** button.



- LED off
- LED on
- * LED flashing

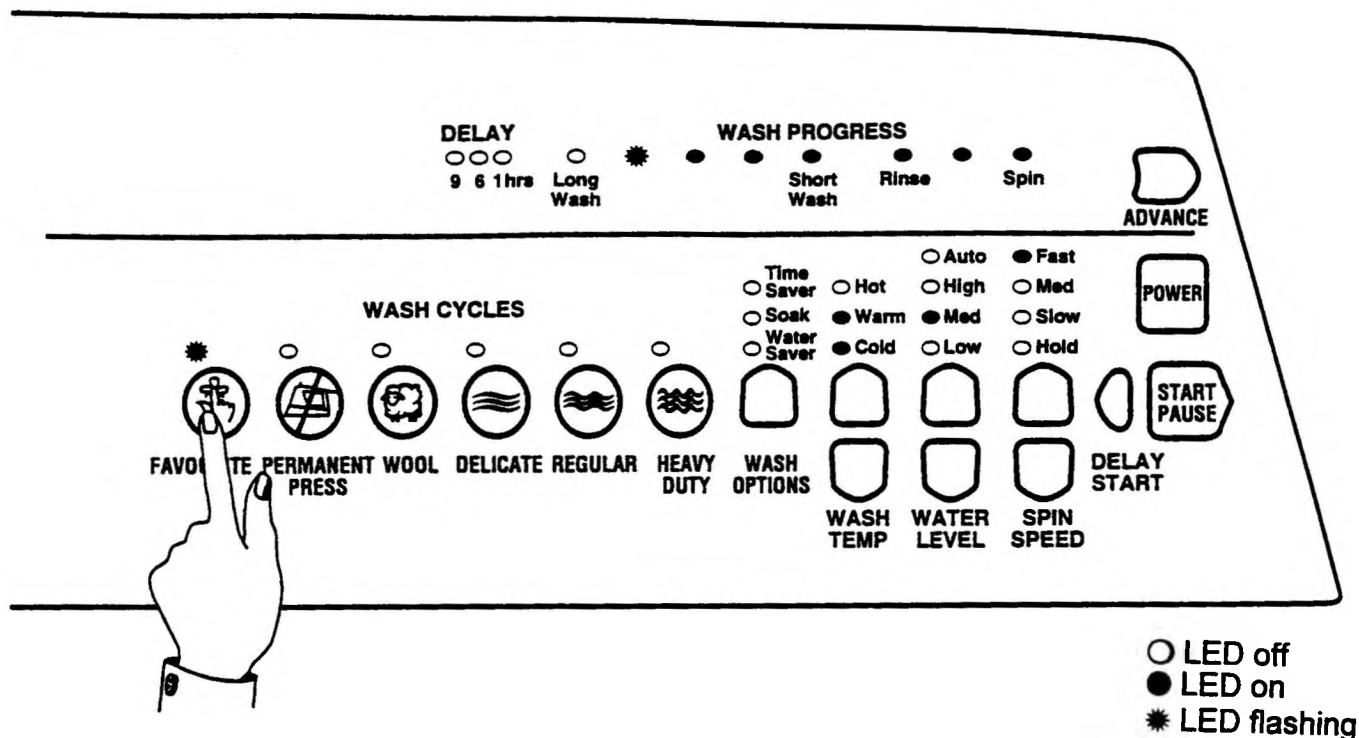
6.2 FAVOURITE CYCLE

The user may have a particular combination of wash cycle settings that are used frequently, i.e. Nappy wash, small load of Gym gear, cold water wash etc.

It is possible to programme this favourite setting into the memory.

Programming the FAVOURITE CYCLE

1. Press and hold the **FAVOURITE** button until beeps are heard and the FAVOURITE LED starts to flash.



2. Select the preferred wash cycle and other options using buttons as normal.
3. When the desired options are selected, press the **FAVOURITE** button again. The FAVOURITE LED will stop flashing.

The FAVOURITE CYCLE is now programmed and can be changed at any time by following the above steps.

To select the **FAVOURITE** cycle.

Press the **FAVOURITE** button. The pre-programmed cycle will appear on the front panel.

If you wish to change any of the settings, simply press the appropriate button. The FAVOURITE LED will go out. This will not change the programme in memory.

The FAVOURITE CYCLE programme will be retained in memory even if the mains power is switched off.

6.3 CUSTOMISING THE WASH CYCLES (GW ONLY)

All the wash cycles can be mini favourite cycles. The Smart Drive can be programmed to automatically set the wash options and agitation time, when each wash cycle is selected. For instance, the user may want to set the Regular cycle to cold wash or set Heavy Duty to include a soak.

Once the wash cycles are programmed, the Smart Drive will remember them, even when turned off at the wall.

TO CUSTOMISE THE WASH CYCLES

1. Press the wash cycle you wish to customise and hold down for 2 seconds.
2. The machine will give two quick beeps and the wash cycle light will flash telling you that you are in the programming mode.
3. Select your wash options.
4. If you would like to decrease the agitation time, press ADVANCE until the required number of green lights remain.
(Each green light in the wash progress represents 3 minutes of agitation.)

To increase the agitation time keep pressing ADVANCE until all the green lights are displayed again.

NOTE: On Heavy Duty and Wool you can only decrease the wash time

5. Press the wash cycle again to store your customised cycle.

To change your customised wash cycle repeat these steps.

NOTE: The customised wash cycles cannot be set to start at the rinse or spin stage.

6.3.1.WATER SAVER - GW models

The WATER SAVER option can be used to minimise the amount of water used during a Regular or Heavy Duty wash cycle.

When the Water Saver, is selected the Smart Drive will alter the rinse phase to a give a shower rinse. A shower rinse alternately showers the clothes with water and spins them to remove the sudsy water.

- **The Water Saver option is not designed to be used with fabric softener.**
The shower rinse does not use a deep rinse so it cannot dispense fabric softener correctly.
- There are some wash loads that may not suit being washed using the Water Saver option.
For instance, loads that have a lot of sand or sawdust etc in them, or garments where the colour still runs from them.

AMOUNT OF WATER USED IN THE WATER SAVER RINSE

MODEL	SHOWER RINSE	SPRAY & DEEP RINSE
703	60 litres	115 litres
603	50 litres	105 litres
503	40 litres	90 litres

Please note, these are approximate figures for high water level.

TO USE WATER SAVER

1. Select REGULAR or HEAVY DUTY wash cycle and your wash options.
2. Select WATER SAVER using the wash option button.
3. Press START / PAUSE.

The Time Saver or Soak option can be used with the Water Saver option, push the wash options button until both options have been selected.

Note: Water Saver is only available on the Regular and Heavy Duty cycles. If you try to select Water Saver on the Wool, Delicate or Permanent Press cycle your Smart Drive will skip over the option.

6.3.2. ADJUSTING THE VOLUME OF WATER USED IN THE WATER SAVER OPTION - GW models

You can increase or decrease the volume of water added during the shower rinse on the Water Save option.

1. Enter the Option Adjustment Mode as explained on page 18.
2. Use the WATER LEVEL buttons to select the volume of water you wish to be used in the shower rinse.
HIGH L.E.D on = more water
MED L.E.D on = factory set water volume
LOW L.E.D on = less water
3. Press POWER to return to normal mode.

6.3.3. AUTO WATER LEVELS - GW models

Your Smart Drive can automatically select the appropriate water level for the load.

1. Place the clothes in the machine.
2. Select wash cycle (Select AUTO if not automatically selected).
3. Press START/PAUSE.

During fill the machine will pause occasionally to sense the water level. The machine will check if the water level is correct by using a series of 2 different agitate strokes. A slow stroke to sense the load and a agitate stroke to mix the load. **If you lift the lid and the machine stops filling or agitating, the machine is still in the fill mode.** If it detects that that water level is not enough it will fill with more water and re-check the level.

- **When washing an unusual load eg large bulky garments, pillows, we recommend that the water level is manually selected .**

- Manually select the water level if there is already water in the bowl.

Note: If the machine does not fill to the correct level, the water level the machine selects can be adjusted refer instructions **AUTO WATER FILL LEVEL ADJUSTMENT 6.3.4 .**

MANUAL WATER LEVEL SELECTION

The agitator has 5 levels marked on its stem that can be used to help the user select the correct water level. Select the correct water level by using the mark nearest to the top of the clothes.

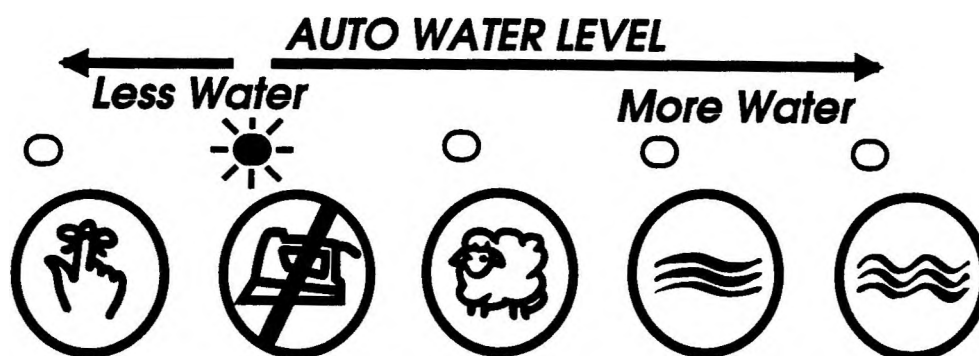
- The levels marked on the agitator are a guide for the clothes and do not correspond exactly to the water level.
- The Smart Drive may occasionally add water during agitation. This is to maintain the water level due to the release of air trapped in the garments.

6.3.4. AUTO WATER FILL LEVEL ADJUSTMENT- GW models

If the user is not satisfied with the level that the Smart Drive fills to on auto water level, they can increase or decrease the fill level that auto will select.

Note: If there is not enough water for the load, we recommend you check by pausing the machine and pushing the clothes down to see how much spare water is at the bottom of the bowl. Clothes often float and the Smart Drive can sense the water under the clothes.

1. Enter the Option Adjustment Mode as explained on page 18.
2. Use the cycle buttons to increase or decrease the amount of water selected.
FAVOURITE light on = less water
PERM. PRESS light on = factory set level
WOOL light on = more water +
DELICATE light on = more water ++
REGULAR light on = more water +++



3. Press POWER to return to normal mode.

6.3.5 - OUT OF BALANCE RECOVERY ROUTINE GW/MW models

When the Smart Drive is spinning it can sense when the wash load is out of balance and will stop and retry spinning. If the machine still senses an unbalanced load it will stop, give a short burst of beeps every five seconds and the RINSE or SPIN light will flash. The load must be redistributed more evenly. However, GW and MW models have the option where the machine tries to automatically correct out of balance loads. If it detects an unbalanced load, it will fill with water and agitate to redistribute the load before trying to spin up again.

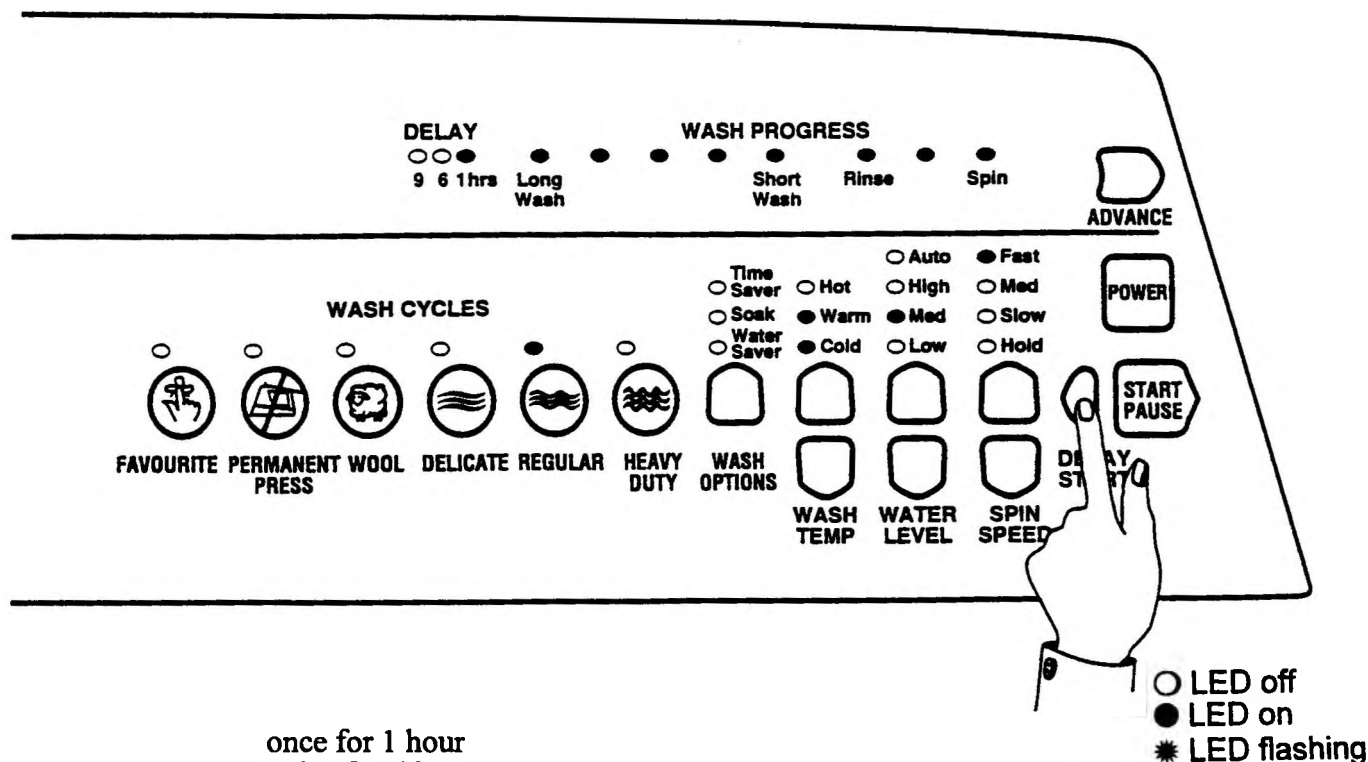
The Smart Drive has this option turned off to conserve water. To programme the machine to automatically try and correct out of balance loads follow the instructions below.

1. Enter the Option Adjustment Mode as explained on page 18.
2. Use the HEAVY DUTY button to select the Out of Balance recovery option you prefer.
HEAVY DUTY light on = automatic
HEAVY DUTY light off = stops
3. Press POWER to return to normal mode.

6.4 DELAY START

To use DELAY START

1. Select your wash cycle and options to suit the clothes load, by pressing the appropriate buttons.
2. Press the DELAY START button.



once for 1 hour
twice for 6 hours
three times for 9 hour delay
four times to cancel and return machine to normal operation.

The machine will now automatically start after the appropriate delay time. The flashing of the wash progress LED will stop when the DELAY START is selected.

If there is a power cut during the delay period and the time remaining is between

- 9 - 6 hrs : the delay start will revert back to 9 hours
- 6 - 3 hrs : the delay start will revert back to 6 hours
- 3 - 1 hr : the delay start will revert back to 3 hours
- 1 - 0 hr : the delay start will revert back to 1 hour

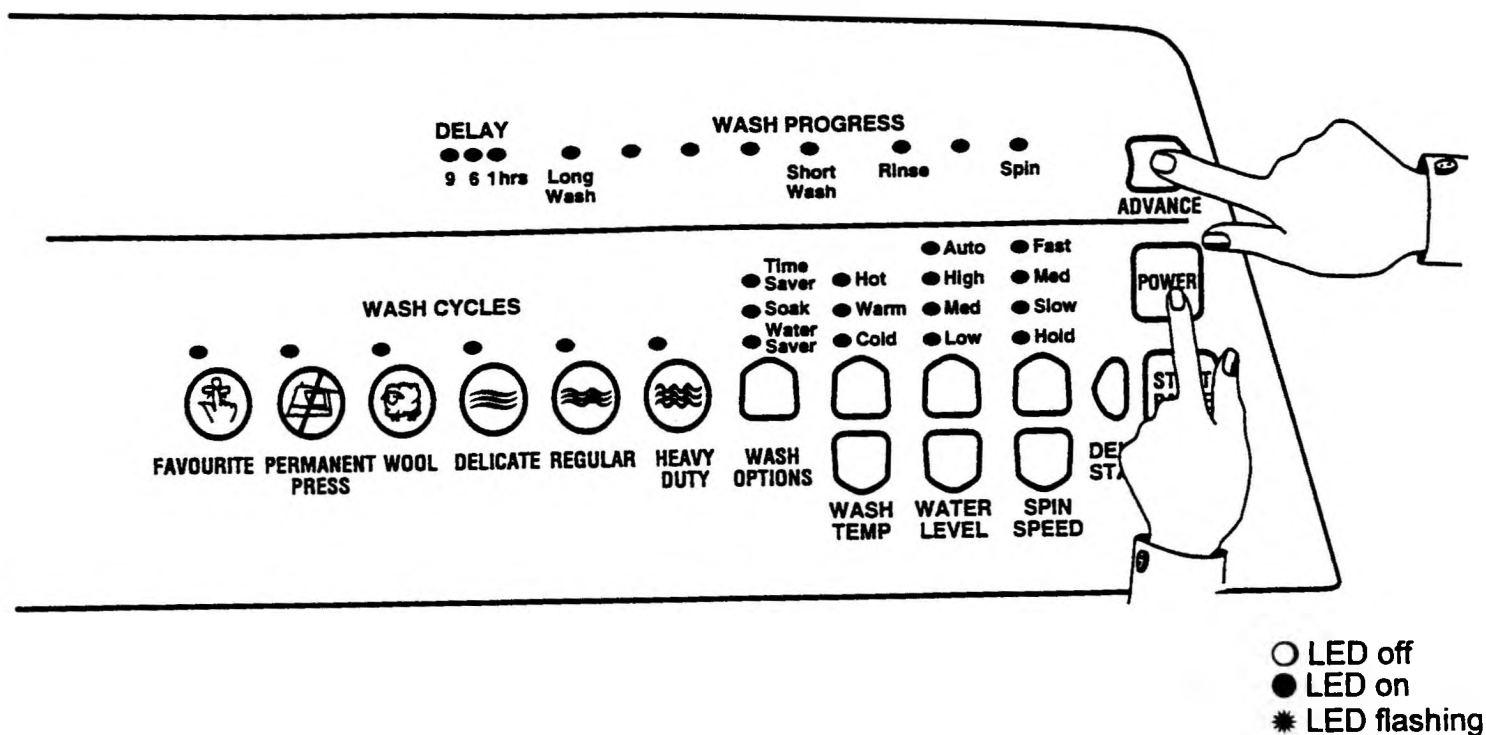
NOTE: It is not possible to select the "Delay Start" feature in the FAVOURITE CYCLE memory.

7.0 DEMONSTRATION MODE

This feature is designed for in store demonstration purposes. The machine can draw attention to itself with flashing LEDs. In this mode the machine cannot be started accidentally.

To Select DEMONSTRATION MODE

1. Press and hold the **ADVANCE** button, then press the **POWER** button.



During the DEMONSTRATION display the LEDs will alternate between all on, LEDs flashing, and all LEDs off.

2. Press the **POWER** button to show the normal user features and displays.

However, if the **START/PAUSE** button is pressed, the machine will sound a warning and will not start rotation. This is designed to protect the machine from being started when it is not fully unpacked, i.e. the bowl packaging material has not been removed or the bottom transit restraint is still in place.

3. Press the **POWER** button to return to the demonstration display.
4. To return the machine to normal operation, the mains supply must be switched off or the mains plug must be removed from the socket.

8.0 WASH CYCLES AND FEATURES

The autowasher has a number of wash cycles and features. The following is an explanation of each cycle and feature. This is more detailed than that in the USE AND CARE MANUAL and may serve to answer any questions the customer may have on the autowasher cycle times.

8.1 WASH CYCLE TIMES

TABLE 3 Wash Cycles Normal Wash

Wash Progress	Regular	Heavy Duty	Delicate	Permanent Press	Wool
Fill	Varies	Varies	Varies	Varies	Varies
Agitate	12 mins.	15 min.	6 min.	9 min.	6 min.
Drain	Varies	Varies	Varies	Varies	Varies
Spray	3-5 min	3-5 min	1 min	1 min	3-5min
Rinse *1	Spray Rinse	Spray Rinse	Deep Rinse	Deep Rinse	Spray Rinse
Fill	Varies	Varies	Varies	Varies	Varies
Final Rinse (Agitate)	2 min.	2 min.	1 min.	1 min.	2 min.
Drain	Varies	Varies	Varies	Varies	Varies
Spin	6min.	6 min.	4 min.	2 min.	6 min.

*1 Spray Rinse times are wash load dependent.

TABLE 4. Wash Cycles Time Saver

Wash Progress	Regular	Heavy Duty	Delicate	Permanent Press	Wool
Fill	Varies	Varies	Varies	Varies	Varies
Agitate	6 min.	6 min.	3 min.	6 min.	3 min.
Drain	Varies	Varies	Varies	Varies	Varies
Spray	2½-4½ min	2½-4½ min	1 min	1 min	2½-4½ min
Rinse *1	Spray Rinse	Spray Rinse	Deep Rinse	Deep Rinse	Spray Rinse
Fill	Varies	Varies	Varies	Varies	Varies
Final Rinse (Agitate)	1 min.	1 min.	1 min.	1 min.	1 min.
Drain	Varies	Varies	Varies	Varies	Varies
Spin	3 min.	3 min.	2 min.	1 min.	3 min.

*1 Spray Rinse times are wash load dependent.

8.1.1 Agitator Profile Comparisons

This autowasher has 15 different agitate profiles. The profile chosen for a particular wash is determined by the wash cycle and water level chosen.

Water Level	Regular Cycle	Heavy Duty Cycle	Delicate Cycle	Permanent Press Cycle	Wool Cycle
High	Prof.10	Prof.15	Prof.5	Prof.10	Prof.5
High/Med	Prof.9	Prof.14	Prof.4	Prof.9	Prof.4
Medium	Prof.8	Prof.13	Prof.3	Prof.8	Prof.3
Med/Low	Prof.7	Prof.12	Prof.2	Prof.7	Prof.2
Low	Prof.6	Prof.11	Prof.1	Prof.6	Prof.1

TABLE 5. Agitate Profiles

Gentle 1 | | | 15 Vigorous

8.3 FABRIC SOFTENER DISPENSER

The fabric softener goes into the dispenser on the top of the agitator. The dispenser is designed to automatically deliver softener into the final rinse.

Here's how it works on the Heavy Duty, Regular and Wool Cycles.

1. Fabric softener remains in the dispenser cup during the fill, agitate and drain phase of the wash programme.
2. During the first phase of the spray rinse it is centrifuged out of the cup into the body of the dispenser.
3. The fabric softener is held hard up against the sides of the dispenser body by centrifugal force throughout the spray rinse.
4. At the end of spray rinse the softener drains out of the dispenser, down the centre of the agitator where it is dissolved in the incoming deep rinse water.



STAGE 1



STAGE 2



STAGE 3



STAGE 4

For the Delicate and Permanent Press cycles the fabric softener remains in the dispenser cup throughout the wash and first deep rinse. The machine then spins to release the fabric softener, delivering it down the agitator stem as the machine fills for the final rinse.

8.4 USER FAULTS

There are a number of faults caused by incorrect installation or operation which the autowasher can detect and sound a warning. (These faults can be corrected by the user).

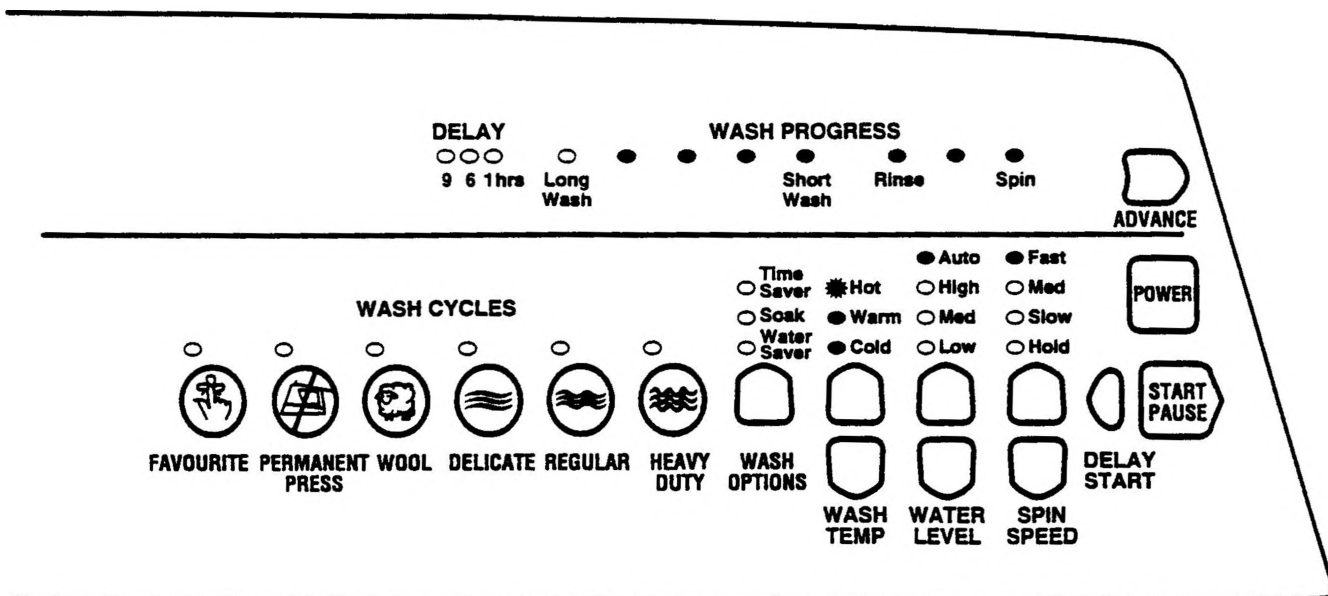
The autowasher signals these faults by flashing an LED (see below) and sounding a tone.

MACHINE IS GIVING A SHORT BURST OF BEEPS* AND ...	POSSIBLE SOLUTIONS
Hot water temperature LED is flashing	1. The hot tap has not been turned on. 2. The hot water temperature is not sufficient to maintain the wash temperature selected. 3. The hot and cold taps have been connected the wrong way around.
Cold water temperature LED is flashing	1. The cold tap has not been turned on. 2. The hot and cold taps have been connected the wrong way around. 3. Cold water supply temperature is above requested temp. (See 6.1.1).
Both Hot and Cold water LEDs are flashing.	1. The hot and cold taps have not been turned on. 2. The hoses are not connected. 3. The household water supply has been interrupted. 4. Check drain hose is installed correctly and it is not syphoning.
High water level LED is flashing.	1. The machine is overloaded and cannot agitate. Remove some clothes from the machine until the remaining clothes can move freely.
Your selected wash cycle, wash option and wash progress LEDs are flashing	1. The power supply has been cut or has fluctuated. The LEDs will flash for 10 seconds after the power is restored and then the machine will continue with the wash cycle.
First rinse or final spin LED is flashing and current spin speed LED is displayed.	1. The wash load is out of balance. The machine has tried Out of Balance retrieval routine but the load is still out of balance. Manually redistribute the load.

* These beeps, (referred to as a user warning) is the same tone that is heard when the machine is first plugged into the mains power.

8.5.1 Insufficient Hot Water

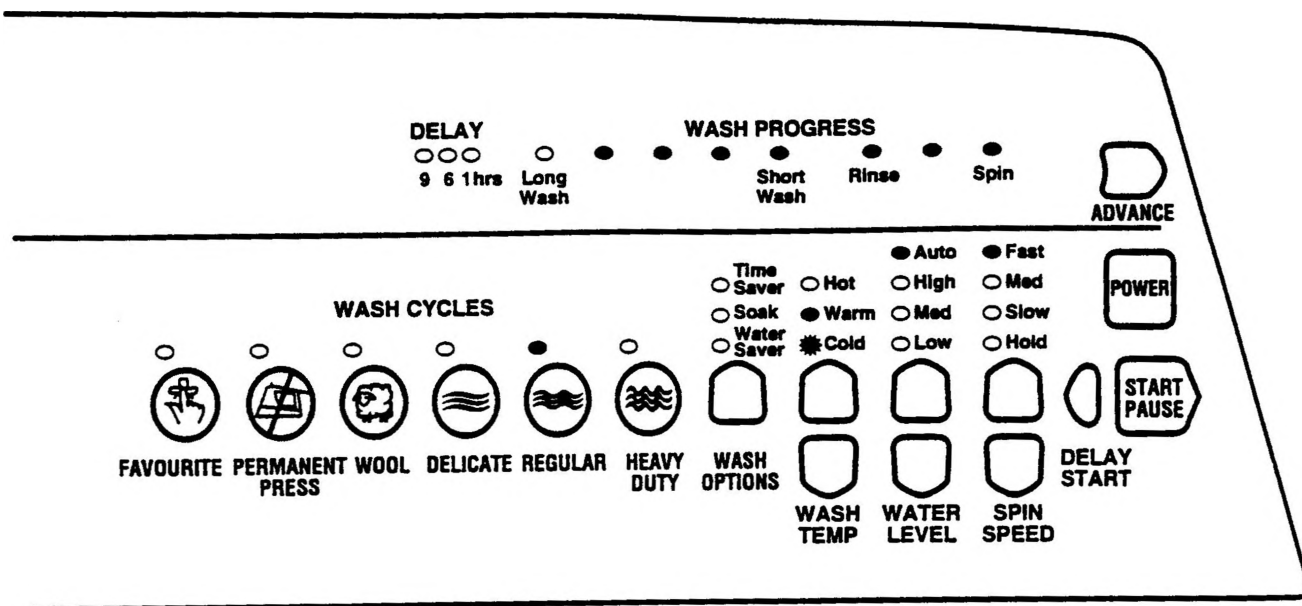
The autowasher will mix hot & cold water to provide the requested wash temperature. If it is unable to maintain the requested wash temperature due to insufficient hot water, the machine will continue to fill, but will sound a user warning. The hot wash temperature LED will flash on the control panel to warn the user that there is insufficient hot water and the wash performance may suffer.



○ LED off
● LED on
* LED flashing

8.5.2 Insufficient Cold Water

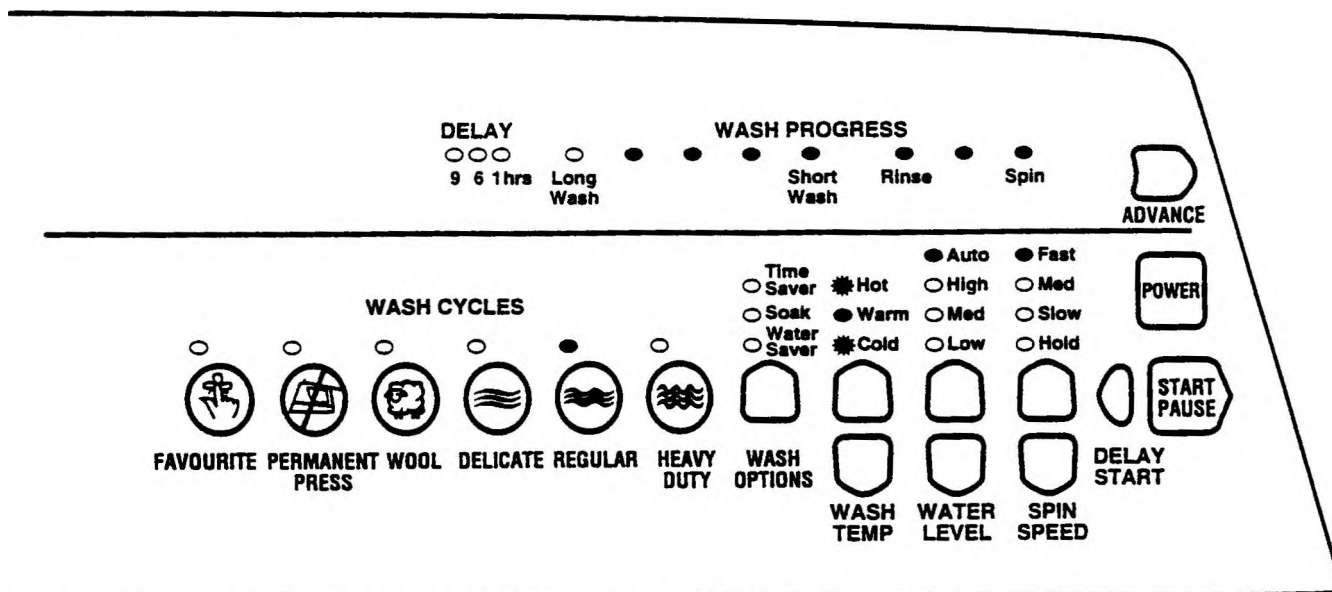
If the machine is unable to maintain the requested wash temperature due to insufficient cold water, the machine will sound the user warning and flash the cold wash temperature LED on the control panel. Without cold water, the machine is unable to maintain the correct operating temperature for some of its components, and enters the pause mode.



○ LED off
● LED on
* LED flashing

8.5.3 No Water

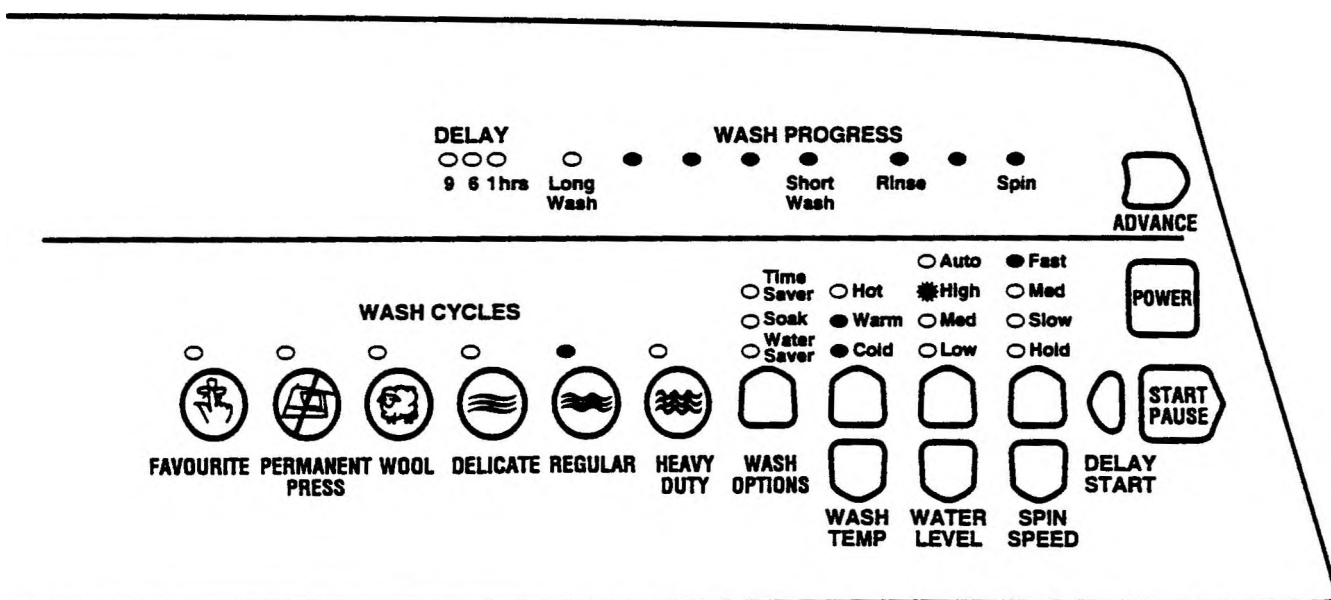
If the hot and cold taps have not been turned on, or the hoses are not connected, the autowasher will detect that the water level is not increasing. This will be indicated by the hot and cold wash temperatures LEDs flashing on the display panel while sounding a user warning.



8.5.4 Overload

If the wash load exceeds the maximum rating for the machine, it may not be able to agitate correctly. The machine will signal this fact by sounding a user warning and flashing the high water level LED on the control panel.

- LED off
- LED on
- ★ LED flashing

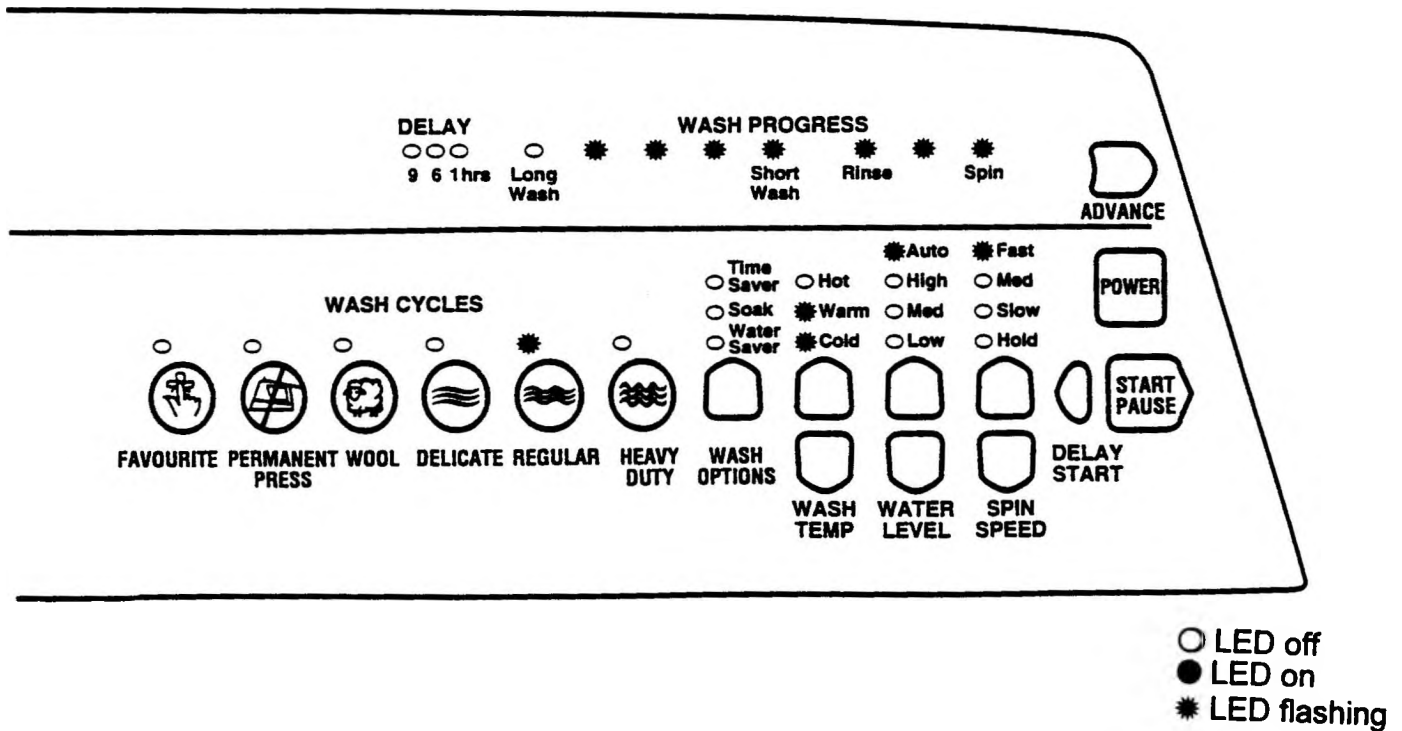


- LED off
- LED on
- ★ LED flashing

8.5.5 Power Supply

If the machine experiences fluctuations in the mains power supply or is operating when a power cut occurs, it will re-commence washing when the power supply has returned to normal. It will give the user prior warning that it is about to re-commence washing by sounding the user alarm and flashing the current wash cycle LEDs on the control panel for 20 seconds. It will then continue from where it was in the cycle when the power was cut. The user can intervene during the 20 second period to start the machine manually with the **START/PAUSE** button.

eg: If the regular wash cycle is only partially completed, these LEDs will flash as illustrated below.

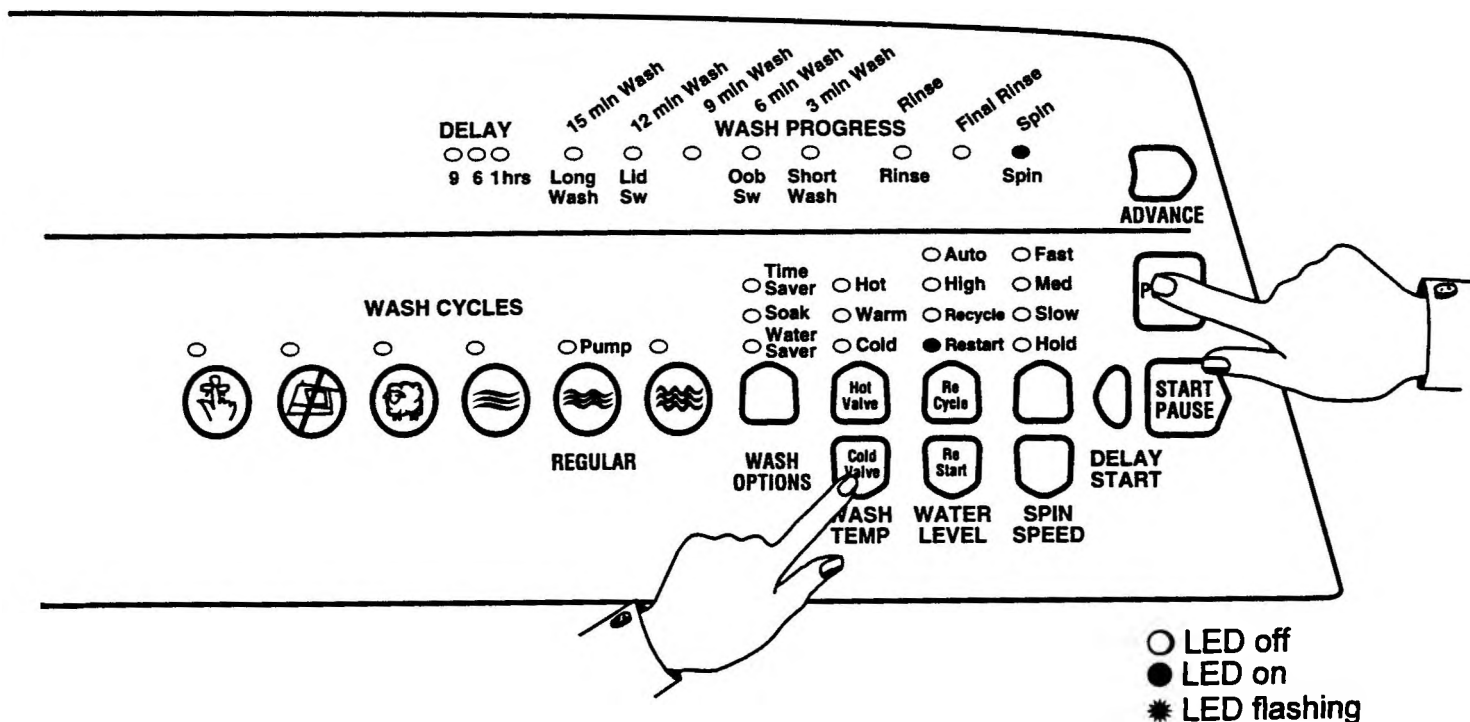


9.0 DIAGNOSTIC MODE

The autowasher is fitted with a diagnostic system designed to help the serviceman test the machine and obtain information that will assist in locating the fault.

To Select DIAGNOSTIC MODE

1. Press and hold the **WASH TEMPERATURE DOWN** button, then press the **POWER** button. The display will change to DIAGNOSTIC MODE. All the LEDs will illuminate and stay on for 5 secs, then the machine will advance to the Data Display Mode (Highwater level LED on). Push the advance button to turn the highwater level LED off this is the Switch Test Mode.



The buttons on the panel will now control the different diagnostic features.

9.1 LED TEST

When the Diagnostic Mode is first selected, all the LEDs should be illuminated. The LEDs will stay on for approximately 5 seconds.

9.2 SWITCH TEST

It is now possible to check the function of the Lid switch, Out of Balance switch and Location switch.

9.2.1 Lid Switch

With the lid closed the 12 minute wash LED should be off. If the lid is open, the 12 minute wash LED will be on.

9.2.2 Out of Balance Switch

Activating the Out of Balance lever located under the top deck will cause the 6 Minute Wash LED to turn on. The Out of Balance lever can be activated by moving the bowl assembly towards the right hand rear corner of the cabinet. It will take up to 1 second for the LED to respond after the OOB lever has been activated.

9.2.3 Location & Size Switch

The autowasher is fitted with a Location & Size switch. This switch is inside the Display Module. It is activated automatically by a plastic pillar moulded into the console.

- (a) When the Display Module is correctly fitted to the console, the switch is activated, and the
SPIN LED for Models GW703
FINAL RINSE LED for Models GW603
RINSE LED for Models GW503/MW053/LW035
will be ON when the DIAGNOSTIC MODE is selected.
- (b) If the Display Module is not correctly fitted in the console, the switch is not activated and the 2 minute wash LED is illuminated.
- (c) When the Display Module is removed for service, the Location switch is deactivated. This protects the information in the memory from being accidentally erased.

9.3 DRAIN PUMP TEST

The **REGULAR** Cycle button turns the drain pump on or off. The **REGULAR** LED will light when the pump is on. This test feature can be used to drain the bowl.

9.4 WATER VALVE TEST

Press the **WASH TEMPERATURE DOWN** button to turn the Cold Water Valve on. The **COLD WATER** LED will turn on.

Press the **WASH TEMPERATURE UP** button to turn the Hot Water Valve on. The **HOT WATER** LED will turn on.

9.5 RE - START FEATURE

WATER LEVEL DOWN button turns the RE-START feature on/off.
LOW WATER LEVEL LED ON = RE-START ON. (Factory setting).
LOW WATER LEVEL LED OFF = RE-START OFF.

1. If a fault occurs in the machine, the diagnostic system will detect it. However, instead of displaying a fault code immediately, the machine will try to RE-START.
2. If the fault was only of temporary nature, the machine will re-start.
3. If there is a continuous fault the machine will try to RE-START a number of times. This process could take up to 8 minutes depending on the type of fault. After this, if the machine still cannot restart, the fault code is displayed and the machine will beep continuously.

The machine leaves the factory with the RE-START feature turned on.

When the machine is being serviced it is more convenient to turn the RE-START feature OFF. This will allow any fault in the system to show up immediately.

Whether the RE-START feature is on or off can be easily identified without going into the DIAGNOSTIC MODE. When the machine is first turned on -

- (a) If no green wash progress LEDs are on, the RE-START feature is on.
- (b) If the green wash progress LEDs are flashing, the RE-START feature is off.

NOTE - This feature is designed as a service aid only and should be left ON in the customer's home. To return to normal operation, and to reset the RE-START feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply

9.6 RE-CYCLE FEATURE

WATER LEVEL UP button turns the RE-CYCLE feature on/off.

MEDIUM WATER LEVEL LED ON = RE-CYCLE ON.

MEDIUM WATER LEVEL LED OFF = RE-CYCLE OFF. (Factory setting).

At the end of servicing, the machine may require an extended test where the machine can be left to complete a number of wash cycles. By turning on the RE-CYCLE feature the machine will continuously repeat the wash cycle until the RE-CYCLE feature is turned off.

Whether the RE-CYCLE feature is on or off can be easily identified without going into the DIAGNOSTIC MODE.

When the machine is first turned on:

- (a) If no orange/red wash progress LEDs are on, the re-cycle feature is off.
- (b) If the orange/red wash progress LED's flash, the re-cycle feature is on.

NOTE - This feature is designed as a service aid only and should be OFF in the customer's home. To return to normal operation, and to return the re-cycle feature to the factory setting, switch the machine off at the wall or disconnect from the mains supply.

9.7 DATA DISPLAYS

It is possible to obtain information about the last fault that occurred in the machine. This information is stored in the memory, and can be recalled in the DIAGNOSTIC MODE.

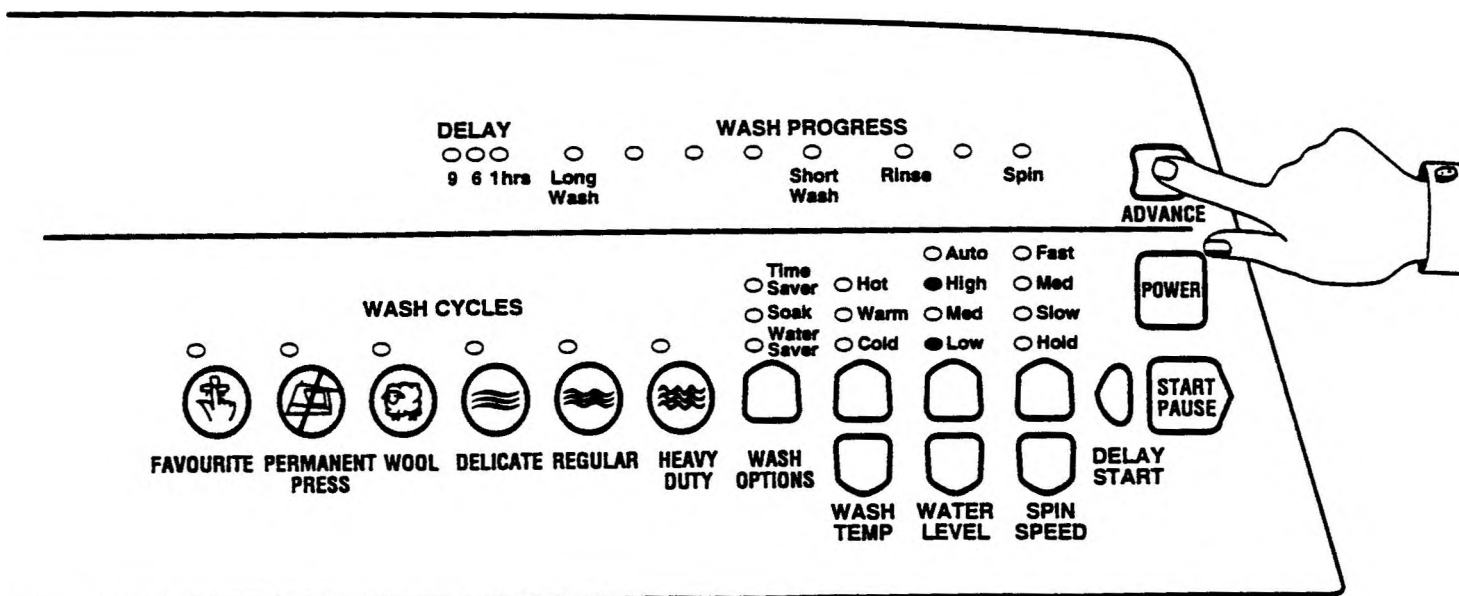
The last information is retained in the memory for 1 cycle after the fault has been rectified.

Up to 16 different types of data can be displayed in the DIAGNOSTIC MODE. However, only the detailed fault is used during field service. The other types are used during manufacture and testing in the factory.

To select **DATA DISPLAYS**

1. Select the DIAGNOSTIC MODE by pressing and holding the **WASH TEMPERATURE DOWN** button and then pressing the **POWER** button.
2. The **HIGH WATER LEVEL LED** will be on. This indicates that you are in DATA DISPLAY MODE. The **SPIN SPEED** buttons and LEDs are used to select the type of data to be displayed. The **WASH PROGRESS LEDs** are used to display the data. Pushing the advance button toggles between Switch Test Mode and the DATA DISPLAY MODE.

Highwater level LED on = DATA DISPLAY MODE
Highwater level LED off = SWITCH TEST MODE

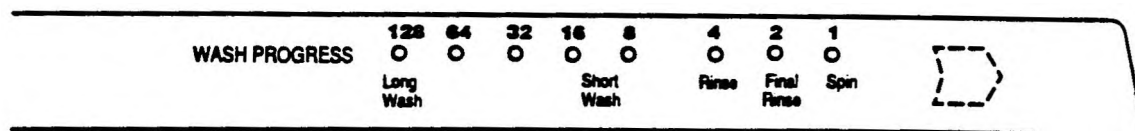


3. Press the **SPIN SPEED UP** button. The spin speed LEDs will change. The LEDs are displaying a binary count. Each time the **SPIN SPEED** buttons are pressed, the count will increase or decrease by one and the pattern of wash progress LEDs may change.

BINARY COUNT			0	1	2	3
	8	○ FAST	○	○	○	○
	4	○ MED	○	○	○	○
	2	○ SLOW	○	○	●	●
	1	○ HOLD	○	●	○	●
			D			

If the detailed fault display is selected, the pattern of the WASH PROGRESS LEDs represent a detailed fault explanation. By adding together the values represented by the illuminated LEDs, a fault number is obtained.

An explanation of each fault number is given in Section 10.0.



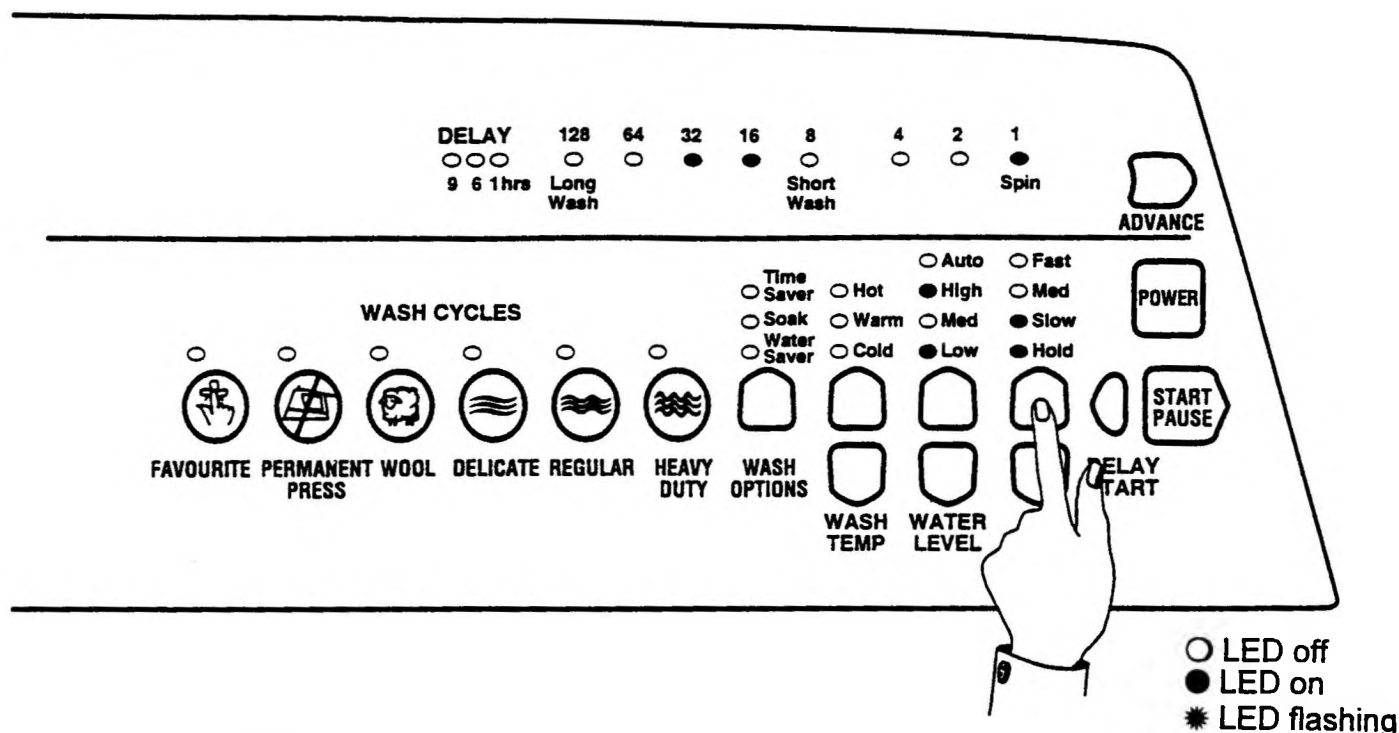
EXAMPLES using the DATA DISPLAYS in the FAULT MODE.

1. Press the **SPIN SPEED UP** button until the **HOLD** and **SLOW SPIN** LEDs turn on. The panel is displaying the **DETAILED FAULT DISPLAY** at last fault.

Binary Count Number 3

Slow spin LED on

Spin hold LED on



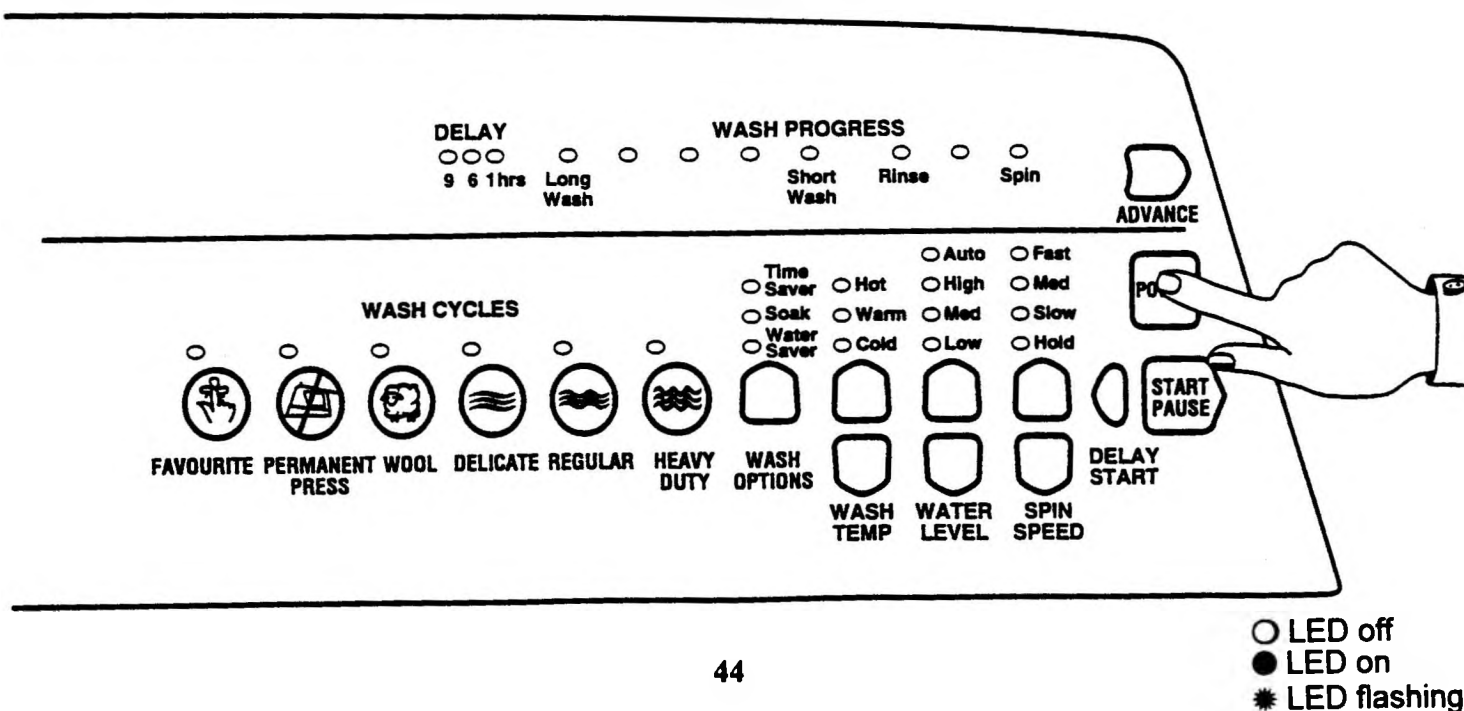
The WASH PROGRESS LEDs show the pattern (00110001). This is Binary Count $32 + 16 + 1 = 49$. This fault number can be looked up in Section 10.1. Number 49 is a COLD WATER VALVE FAULT.

If the **SPIN SPEED UP** button is pressed again, other types of data are displayed. As mentioned earlier these pertain to manufacturing and testing and are not needed for field service.

2. Use the **ADVANCE** button to switch between Data Displays and Switch Test mode.

OR

3. Return to normal operation by pressing the **POWER** button.



FAULT DISPLAY

If the machine enters a fault mode during normal operation, the machine will display the detail fault code on the wash progress LEDs and beep continuously. The spin speed slow and hold L.E.D's will also be displayed

During the above process the beeper will sound continuously. It is advisable to switch the washing machine off at the wall, switch on again, and select the last fault details by entering the data displays. See Section 9.7.

**SMART DRIVE
DIAGNOSTIC INFORMATION
FOR
MODELS
GW703
GW603
GW503 - MW053 - LW035**

INTRODUCTION

The format for fault description in this booklet follows the Primary, Secondary and Tertiary fault source system. These sources have mostly been arranged in order of most likely source of fault but in some cases the sequence has been modified to aid the servicing procedure.

It should be noted that the fault source Pump System includes the pump and drain hose assembly.

FAULT DESCRIPTIONS

1. (00000001) Motor Control Module Fault

The Motor Controller Module has found a memory error.

Primary Source - Motor Control Module.

Action

Replace Motor Control module.

2. (00000010) Motor Control Module Fault

An error has been encountered when trying to read the pressure sensor.

Primary Source - Motor Control Module.

Action

Replace Motor Control module.

3. (00000011) Motor Control Module Fault

The Motor Controller Module has found a memory error.

Primary Source - Motor Control Module

Action

Replace Motor Control module.

6. (00000110) Motor Control Module Fault

The Motor Control module has received an incorrect signal from the pressure sensor.

Primary Source - Motor Control Module

Action

Replace Motor Control module.

7. (00000111) Display Module Fault

The Display module has found a memory fault.

Primary Source - Display Module

Action

Replace Display module.

9. (00001001) Size Switch Error

The Display size switch setting does not match that stored in the memory.

Primary Source - Display Module

Action

If the Display module has just been inserted into a console housing, then check that the two size switch plungers accurately locate onto the console housing. If this fault has appeared during normal operation of the machine, check the size switch or replace Display module.

Secondary Source - Motor Control module

Action

If the Motor Control module has been changed from one size machine to another, then the size switch settings in the memory will have to be reset. This can be done by entering and exiting the Option Adjustment mode. Push and hold START/PAUSE then push POWER button.

10. (00001010) Temperature Sensor Error

The temperature sensor may be open circuit or the ambient temperature is below minus 10°C.

Primary Source - Motor Control module

Action

Change the Motor Control module.

11. (00001011) Pressure Sensor Fault

While measuring the water level the Motor Control micro has detected a negative pressure. This may have been caused by reconnecting the pressure tube to the pressure sensor while the bowl has been partly filled with water.

Primary Source - Motor Control module

Action

- 1) Check bowl is fully pumped out. Remove pressure tube from pressure sensor, clear pressure tube of any water and reconnect tube.
- 2) Replace the Motor Control module.

12. (00001100) Flood Protection Error

The Motor Control module has found the water level to be above the flood level and tried to pump the excess water out (under extremely high flow rate conditions the machine may overfill during the "top-up" routine in agitate). After pumping for 30 seconds, it has been unable to lower the water level below the flood level. Either the water valves are stuck on and are letting water in at a flow rate that is higher than the pump can handle or the pump is blocked and can't remove the excess water.

Primary Source - Water Valves

Action

If the water valves are on continuously, check that the water valves turn off mechanically (remove power from machine).

Secondary Source - Motor Control module

Action

If water valves are being driven on electrically, replace Motor Control module.

Tertiary Source - Pump system

Action

Check pump for blockage and hose for correct height and kinking.

36. (00100100) Water Leak Fault

The Motor Control module has needed to top up the water level more than 4 times during agitate. This is excessive as normally only one or two top ups are required to replace the air that has escaped from a full load during agitate. The most likely cause is that the machine is syphoning. The other alternative is that the machine has developed a leak.

Primary Source - Pump System

Action

- 1) Check the height of the drain hose outlet min 850mm/max 1200mm.
- 2) Check hose guide is fitted and check hose does not protrude more than 20mm beyond guide.

Secondary Source - Mechanical

- 1) Check pressure tube connection on outer bowl and Motor Control module.
- 2) Check that the drive shaft seal and the pump housing seal have not developed a leak, by looking through the front inspection cover.

Tertiary Source - Motor Control Module

Action

Replace Motor Control module.

37. (00100101) Pump Blocked Error

While draining, the water level reading from the pressure sensor has not changed for over 30 seconds. There are three likely reasons for this fault. One is that the drain hose has been squashed or kinked and the pump out rate has been dramatically reduced. The second possibility is that the pump is partially or fully blocked. The third is that the pump is not operating due to Motor Control module, wiring or pump failure. This fault could also appear if the machine is pumping to an unusually high head of drain hose or into an extended length of drain hose.

Primary Source - Pump System

Action

- 1) Check that the drain hose has not been kinked.
- 2) Check length of drain hose and try to reduce length if excessively long. A 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
- 3) If bowl empty of water, remove pump from pump housing through the inspection hatch and check that it is not blocked. Also check the hose is not blocked.
- 4) If bowl contains water, attempt to flick start the pump fan while draining to clear water before servicing as in 3. If unsuccessful then service pump from the top of the machine by removing the top deck and inner bowl.
- 5) Check for open circuit windings in the pump. (Note: Pumps are fitted with a thermal cut-out which will reset on cooling).

Secondary Source - Wiring

Action

- 1) Check Pump Harness is connected correctly to pump.
- 2) Check continuity of pump harness.

Tertiary Source - Motor Control Module

Action

Activate Pump by operating the machine in spin mode. Check Pump is rotating by viewing through the inspection hatch. If not operating and Primary and Secondary checks have been performed then replace Motor Control module.

38. (00100110) Pressure Sensor Fault

The Motor Control module has recorded a water level of empty while it is agitating. The water level must have been greater than empty for the machine to enter the agitate mode initially. The most likely cause of this fault is that the pressure sensor hose has been severed or fallen off during agitate. Alternatively the pressure sensor may be faulty.

Primary Source - Mechanical

Action

Check that the pressure tube is intact and has not been cut.

Secondary Source - Motor Control module.

Action

Replace the Motor Control module if the pressure tube shows no sign of being faulty.

39. (00100111) Pressure Tube Fault

The probable cause of this fault is that the pressure tube has become blocked or kinked or has fallen off completely. Alternatively the pressure sensor may be faulty.

Primary Source - Mechanical

Action

Check that the pressure tube is intact and not blocked with water, dirt or kinked.

Secondary Source - Motor Control module

Action

Replace Motor Control module.

40. (00101000) Bowl Dis-engage Fault

While carrying out a bowl check, the Motor Control module has found that the bowl is not engaged even though the pressure sensor indicates that the bowl is empty. The Motor Control module continues to check for 2 minutes after which time it displays this fault. The first two areas to check are the clutch and the pressure tube. If these two appear correct, then the fault could be in the pressure sensor in the Motor Control module.

Primary Source - Mechanical

Action

- 1) Check that there are no clothes or other foreign objects preventing the clutch from re-engaging.
- 2) If the machine is empty of water carry out a clutch disassembly procedure and check the spline drive.
- 3) Next check that the pressure tube has not come off and that it is not kinked.

Secondary Source - Motor Control module.

Action

Replace Motor Control module

41. (00101001) Temperature Sensor Fault

The temperature sensor is measuring temperatures above 110°C. The fault is probably due to a short circuit in the sensor line.

Primary Source - Motor Control module

Action

Replace the Motor Controller module.

43. (00101011) OOB Switch Fault

The Motor Control Module has found that the signal returning from the out of balance switch indicates that the switch is permanently on or the harness to it is disconnected.

Primary Source - Mechanical

Action

- 1) Check that the out of balance switch is free to move.
- 2) Check that no harnesses are blocking switch movement.
- 3) Check switch operates correctly when activated. Replace switch if suspect.

Secondary Source - Wiring

Action

Check the harness to the switch is connected correctly. The terminals should be connected to the normally closed position.

Tertiary Source - Motor Control module

Action

Replace Motor Control module.

44. (00101100) Water in Bowl during Spin

The Motor Controller has sensed a water level in the bowl during spin. This may be caused by a slow pump out rate due to pump hose or pump partial blockage.

Primary Source - Pump System

Action

- 1) Check that the drain hose is not squashed or kinked.
- 2) Check length of drain hose and try to reduce length if excessively long. A 1 metre extension hose of the same diameter fitted to the existing drain hose is the maximum allowable length.
- 3) If bowl empty of water, remove pump from pump housing through the inspection hatch and check that it is not blocked. Also check the hose is not blocked.
- 4) If bowl contains water, attempt to flick start the pump fan while draining to clear water before servicing as in 3). If unsuccessful then service pump from the top of the machine by removing the top deck and inner bowl.

Secondary Source - Motor Control module.

Action

Replace Motor Control module.

47. (00101111) Bowl Dis-engage Fault

While carrying out a bowl check, the Motor Control module has found that the bowl is not engaged even though the pressure sensor indicates that the bowl is empty. The Motor Control module continues to check for 2 minutes. During this time the module has not been able to determine a valid bowl status and so displays this fault. This fault differs from fault 40 in that a valid bowl status could not be determined. The first two areas to check are the clutch and the pressure tube. If these two appear correct, then the fault could be with the pressure sensor in the Motor Control module.

Primary Source - Mechanical

Action

- 1) Check that there are no clothes or other foreign objects preventing the clutch from re-engaging.
- 2) Next check that the pressure tube has not come off and that it is not kinked.

Secondary Source - Motor Control module.

Action

Replace Motor Control module, if the above checks out without fault.

48. (00110000) Hot and Cold Valve Faulty

The Motor Control module has measured voltages from the valve diagnostic circuit that indicate both the hot and cold valve are faulty. The most likely cause is that the valve harnesses have not been connected correctly.

Primary Source - Wiring

Action

Check valve harnesses are correctly fastened to valves.

Secondary Source - Water Valves

Action

Check valve coils are not faulty (open circuit).

Tertiary Source - Motor Control module

Action

Replace the Motor Control module.

49. (00110001) Cold Valve Faulty

The Motor Control module has measured a voltage from the valve diagnostic circuit that indicates the cold valve is faulty. The most likely cause is that the valve harness has not been connected correctly. See fault 48 for service procedure.

50. (00110010) Hot Valve Faulty

The Motor Control module has measured a voltage from the valve diagnostic circuit that indicates that the hot valve is faulty. The most likely cause is that the valve harness has not been connected correctly. See fault 48 for service procedure.

81 - 95. (0101xxxx)

104. (01101000)

106. (01101010) Display to Motor Control module Communications Errors

These faults are reported when the Display module detects an error in the communications between the Display module and the Motor Control module.

Primary Source - Display module.

Action

Replace Display module.

Secondary Source - Motor Control Module

Action

Replace Motor Control module. If the new Motor Control module corrects the fault, refit the original Display module.

105. (01101001) Display to Motor Control module Communications time-out Error

This fault is reported when the Display module has lost contact with the Motor Control module. It has detected that the communications line is connected to the Motor Control module.

Primary Source - Display module.

Action

Replace Display module.

Secondary Source - Motor Control Module

Action

Replace Motor Control module. If the new motor control module corrects the fault, refit the original display module.

107. (01101011) Motor Control module Reset Error

The Display Module has detected that the Motor Control module has reset when it should not have. This can be due to a Motor Control module supply disturbance or micro processor failure.

Primary source - Motor Control module.

Action

Replace Motor Control module.

130 (10000010) Single Rotor Position Sensor Error

The Motor Controller has found an error in the pattern received from the Rotor Position Sensor. Likely causes of this fault are a bad connection on the harness between the Rotor Position Sensor and the Motor Controller, or a faulty Rotor Position Sensor.

Primary Source - Wiring

Action

- 1) Check for corrosion on the edge connector of the Rotor Position Sensor and the Motor Control module connector.
- 2) Check the contacts on the rotor positional sensor end of the hall harness to see if any have been damaged. (Each set of contacts in the socket has two wipers. If the distance between these wipers varies between different contacts, replace the rotor positional sensor harness).

Secondary Source - Rotor Position Sensor

Action

Check the Rotor Position Sensor with an R.P.S. tester. Replace if faulty.

Tertiary Source - Motor Control module

Action

Replace Motor Control module.

131. (10000011) Repetitive Rotor Position Sensor Error

This fault is similar to fault number 130 above but differs slightly in that it is a continuous condition. See fault 130 for service procedure.

132. (10000100) Single Current Trip

The Motor Controller has detected excess current in the motor or electronic switches. This fault has occurred momentarily.

Primary Source - Wiring

Secondary Source - Motor

Action

- 1) Measure/check the motor harness, connectors and motor for shorts. This can be done by taking a resistance measurement between phases of the motor harness at the Motor Control module end. Nominal resistance should be around 12.2 ohm.
- 2) Check the Rotor Positional Sensor and associated harness for water, mechanical damage or corrosion.

Tertiary Source - Motor Control module

Action

If all the above show no signs of fault then replace the Motor Control module. Also check for water leaks from the cooling chamber or valves that could possibly come in contact with the Motor Controller and fix the leak before replacing with new Motor Control module.

133. (10000101) Repetitive Current Trip

The Motor Controller has detected excess current in the motor or electronic switches. This fault is a more severe occurrence than Fault Number 132 but has identical fault sources and fault service procedure.

136. (10001000) Motor Stall

The Motor Controller has been unable to start the motor. Possible causes of this fault are: Faulty motor harness, faulty or jammed motor, seized bearings or seals, faulty Motor Control module, faulty Rotor Position Sensor or harness.

Primary Source - Wiring

Action

Measure/check the motor harness, connectors and motor for discontinuity. This can be done by taking a resistance measurement between phases of the motor harness at the Motor Control module end. Nominal resistance should be around 12.2 ohm.

Secondary Source - Motor

Action

- 1) Check free rotation of the agitator and bowl by rotating by hand. Bearings and seals may be seized.
- 2) Check the Rotor Position Sensor and associated harness for water, mechanical damage or corrosion.

Tertiary Source - Motor Control module

Action

If the primary and secondary checks pass inspection then replace the Motor Control module.

160. (10100000) Bowl Engaged

The bowl has re-engaged itself during agitate. Possible causes for this are a leak in the air bell, bowl is over-loaded with clothes, the clutch has jammed or is fouled with a foreign object.

Primary Source - Mechanical

Action

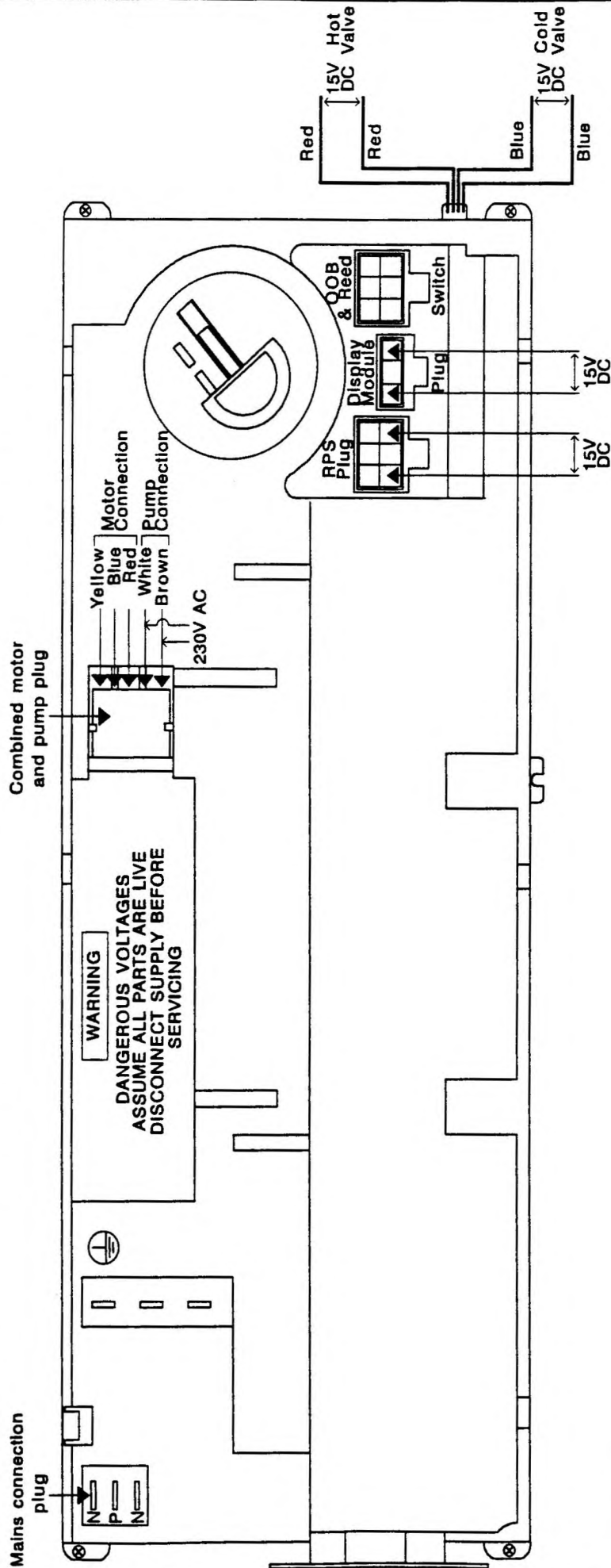
Secondary Source - Motor Control Module

Action

If the machine is empty of water at fault it is possible that the pump circuit is faulty and has caused a pump out during wash. This would cause the bowl to re-engage during agitate and the Motor Control module to display this fault. Replace Motor Control module.

NOTES

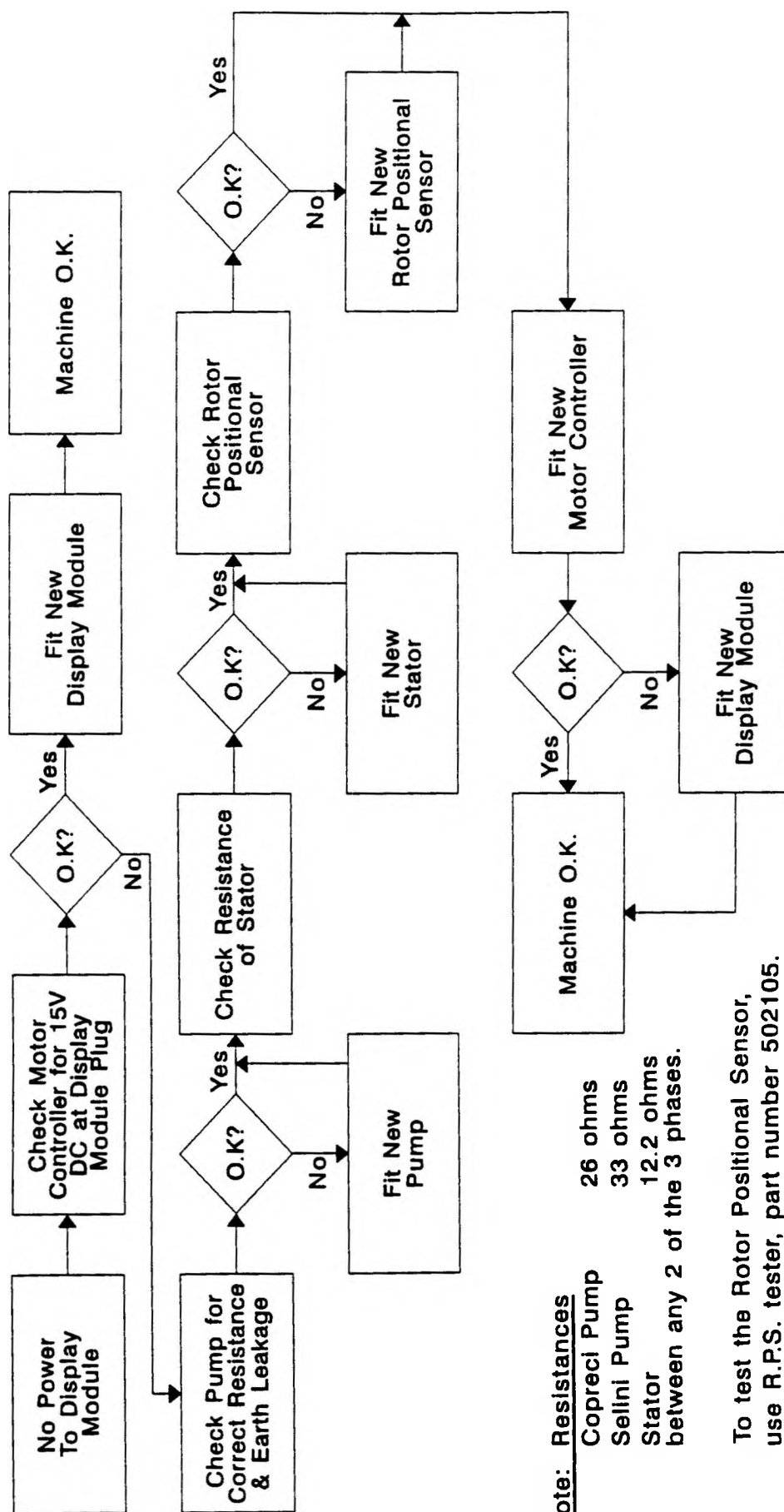
SMART DRIVE MOTOR CONTROLLER VOLTAGE CHECKS



CAUTION:

The Phase 2 motor controller can be checked for voltage at the points shown in the diagram, however extreme care must be taken when carrying out these checks. Between either the brown or white pump connections and earth there is 230 volts AC. Between the other 15 volt DC connections and earth there is 115 volts DC present.

DIAGNOSTIC FLOW CHART FOR SMART DRIVE



11.0 REMOVING AND REFITTING OF ELECTRONIC COMPONENTS

CAUTION

ALL TERMINALS AND INTERNAL PARTS SHOULD BE TREATED AS LIVE.

**ALL SERVICING SHOULD BE CARRIED OUT WITH THE MACHINE DISCONNECTED
FROM THE POWER SUPPLY.**

Unlike our previous electronic autowasher where the voltages in the Console area were only 24V, this autowasher has a 230V AC voltage on ALL terminals.

The autowasher **POWER** button on/off switch DOES NOT isolate the mains voltage from the machine.

11.1 ESD PRECAUTIONS

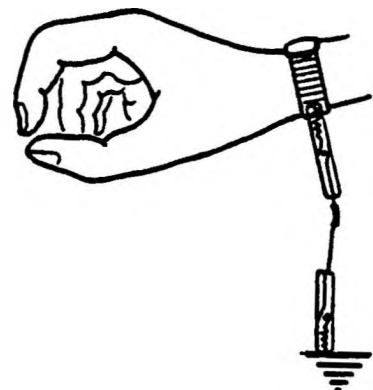
An anti-static wrist strap must be used when handling the electronic modules and the Rotor Position Sensor. Clip the strap to a suitable earth connection.

Modules removed from the machine for return must be protected from possible electrostatic damage (ESD) while in transit by the use of the specialised packaging in which they were received.



CAUTION

**ELECTROSTATIC
SENSITIVE DEVICES
OBSERVE HANDLING
PRECAUTIONS**



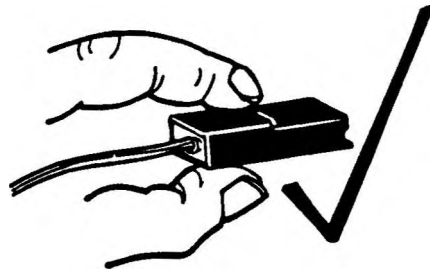
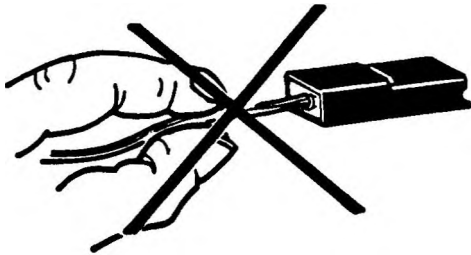
**GROUNDING
TO EARTH**

11.2 CONNECTORS

11.2.1 "Posilock" Connectors

The Motor, Water Valves and Out of Balance Switch use "Posilock" connectors. These types of connectors require low insertion and removal force **provided** they are removed by gripping the black insulator housing.

DO NOT try to remove these connectors by pulling on the wire leads. This can result in damage to the lead and connector.



11.2.2 Edge Connector

The Rotor Position Sensor is fitted with an edge connector.

Remove this connector by gripping the plastic housing and gently easing the connector out. **DO NOT** pull by the wires.

11.2.3 Motor/Pump Connectors, Rotor Position Sensor, Display and OOB Harness in Top Deck

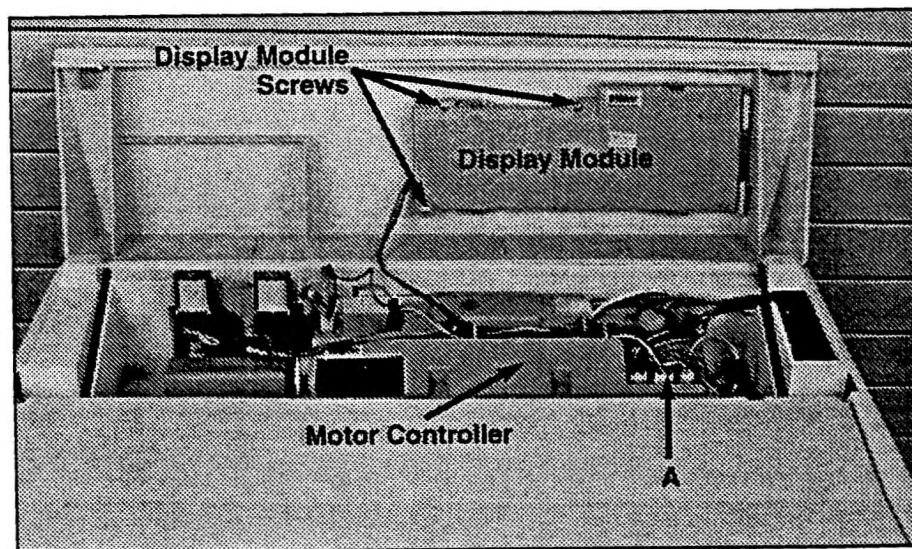
These connections are fitted with polarised connectors. Care should be taken to insert these in the correct way.

11.3 ACCESS TO CONSOLE AREA

1. Remove 2 screws from the rear of the top console.
2. The console can now be raised for access to the Motor Controller Module, Display Module and associated wiring.

11.4 DISPLAY MODULE

1. Connect an anti-static wrist strap to earth.
2. Unplug the 3 way wiring harness (A) from the Motor Controller module.
3. Unscrew the 3 screws holding the DISPLAY MODULE to the console.
4. Remove the DISPLAY MODULE from the console.



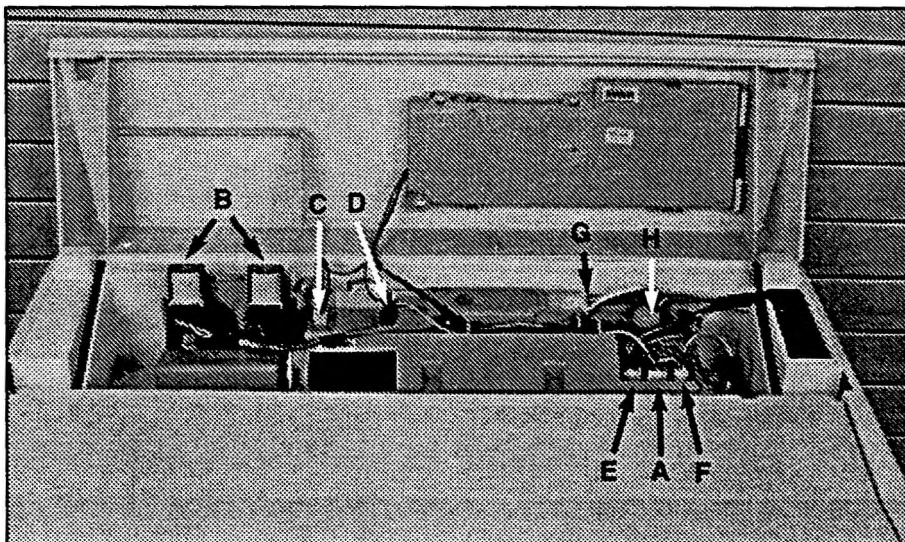
Carry out the Diagnostic Test refer Section 9. Do not poke any tools or instruments into either module as damage to the electronic components could result.

NOTE: Any Modules removed from the machine for return must be protected from possible electrostatic damage. Use anti-static bag.

11.5 MOTOR CONTROLLER MODULE

If possible record the user's preferred options before removing the MOTOR CONTROLLER MODULE.

1. Connect an anti-static wrist strap to earth.
2. Unplug the harnesses
 - (A) Display Module
 - (B) Water Valves
 - (C) Mains Plug
 - (D) Pump earth and Mains earth
 - (E) Rotor Position Sensor Harness
 - (F) Out of Balance and Lid Reed Switch Plug
 - (G) Motor/Pump Harness
 - (H) Pressure Tube

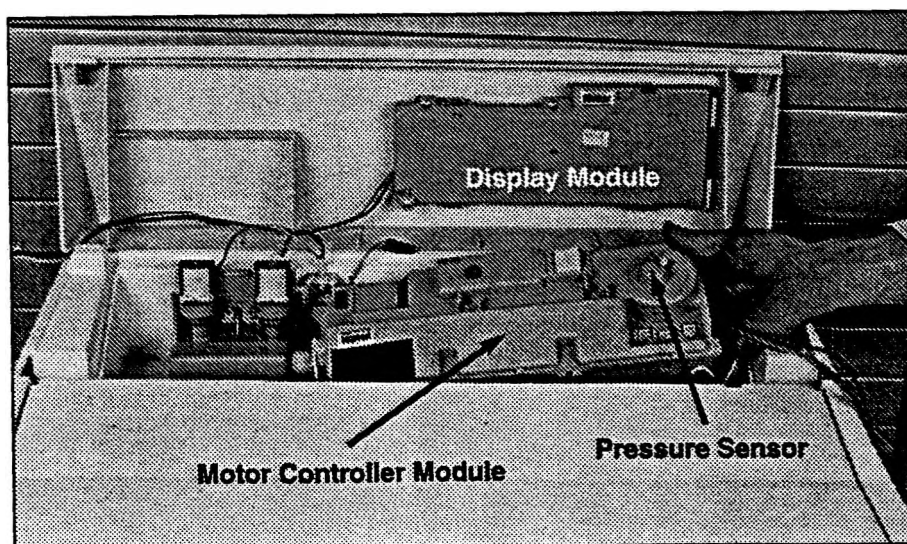


3. Ensure the anti-static wrist strap is still connected to earth.
4. Remove the screw locating the motor controller to the top deck.
5. Lift the motor controller up at the pressure sensor end and ease away from the inlet chamber.
When the Motor Controller Module is separated, a small quantity of water will discharge from the inlet chamber and heatsink. This must be dried off before refitting.

Note

When reassembling ensure console area is dry. Lubricate sealing grommets with soapy water or liquid detergent.

6. When reassembled enter option adjustment mode to set the microprocessor for the size of the machine.
7. Reprogramme the users preferred options.



11.6 INLET CHAMBER & WATER VALVES

1. Remove Motor Controller. Refer 11.5.
2. Remove inlet hoses. Take care not to spray water into console area.
3. Remove the two screws located between the inlet valves and remove the screw from the top of the inlet chamber.
4. Lift the inlet chamber and remove water valves.
5. Reassemble in reverse order.
6. When refitting the water valves ensure proportional cold valve is fitted in its correct place as marked on top of the inlet chamber.

11.7 ROTOR POSITION SENSOR

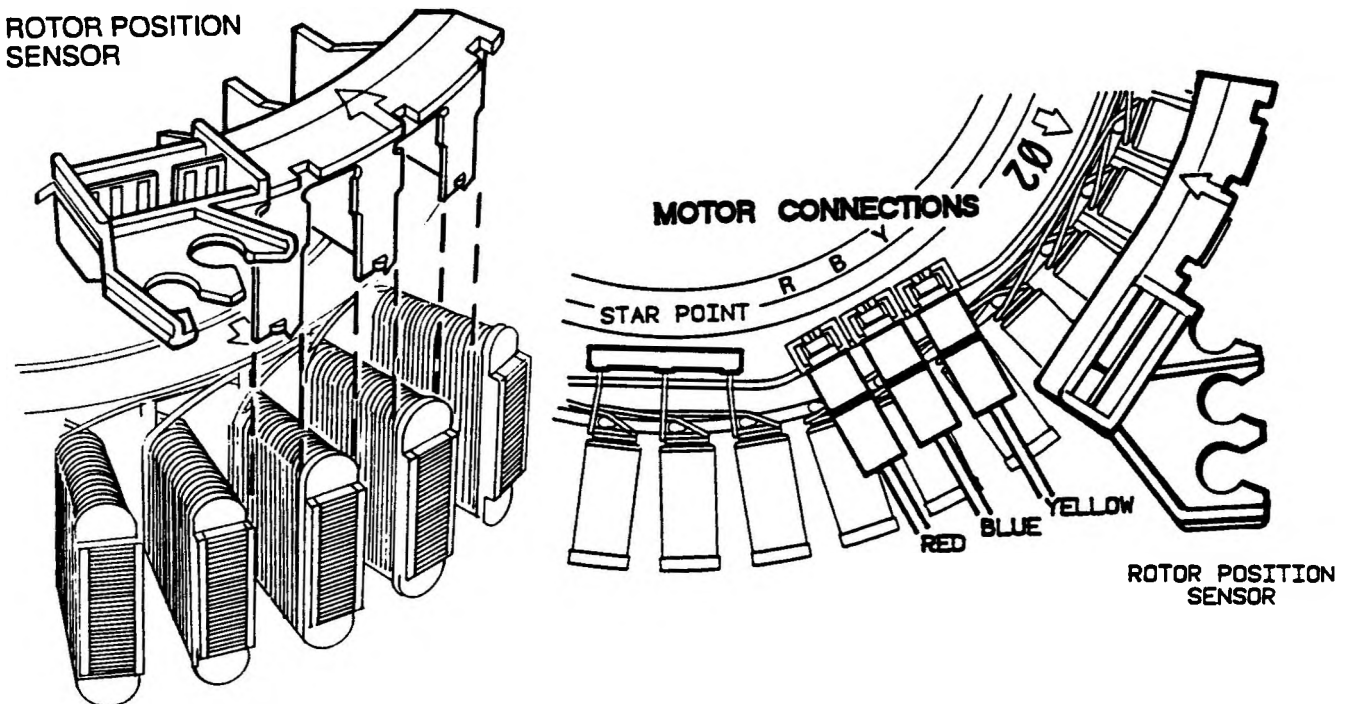
This device must be treated with care. Use ESD precautions at all times. Connect an anti-static wrist strap to earth.

Do not remove the printed circuit board from the plastic housing.

Do not use a multi-meter to check the resistance of the sensors. This may result in damage.

To test the rotor position sensor use a R.P.S. tester part number 502105.

ALIGN ARROWS



1. Refer Section 15.3 for motor removal.
2. Unclip the rotor position sensor module from the stator and slide it out.
3. When refitting, line up the arrows on the Rotor Position Sensor and Stator. Slide the Rotor Position Sensor into the Stator poles until the clip locks into the notch on the other side of the Stator. Refer diagram Section 11.7.
4. To refit motor, refer Section 15.3

11.8 DIAGNOSTIC TEST

IMPORTANT

After replacement of an electronic component, carry out the following diagnostic functional tests.

1. Select the Diagnostic mode (see Section 9.0 to 9.6). Check the LEDs, Lid switch, Out of Balance switch, Location switch, Pump test and Water valve test.
2. If the Re-start or Re-cycle features have been used during the servicing procedure, return these to the standard factory settings. This can be achieved by unplugging the machine at the wall.
3. **Functional Test**
Check basic machine functions, ie fill, agitate, pump out and spin.
4. Enter Optional Selection Mode (Section 6.0) to reset size switch setting.

11.9 LID REED SWITCH

1. Isolate from the power supply.
2. Remove Motor Controller. Refer 11.3 and 11.5.
3. Disconnect the wiring from the out of balance micro switch.
4. Remove the lid assembly.
5. Remove the 2 rubber buffers and screws from the front of the top deck.
6. Release the top deck retaining clips at the rear of the cabinet (Refer diagram page 62).
7. Tilt the top deck back and rest against a wall.
NOTE The top deck is not self supporting on the retaining clips..
8. Unscrew the reed switch retaining clip and remove the reed switch and wiring from retention features in top deck.
9. Assemble in reverse order ensure wiring is secured correctly in retention features.

MECHANICAL SERVICE SECTION

COMPLETE DISASSEMBLY SECTION 13

CAUTION

Ensure the power and water supplies are disconnected before servicing. There is still power to components with the console on/off switch in the 'off' position.

1. Isolate from the power supply.
2. To remove the lid, open it to the upright position and lift it clear.

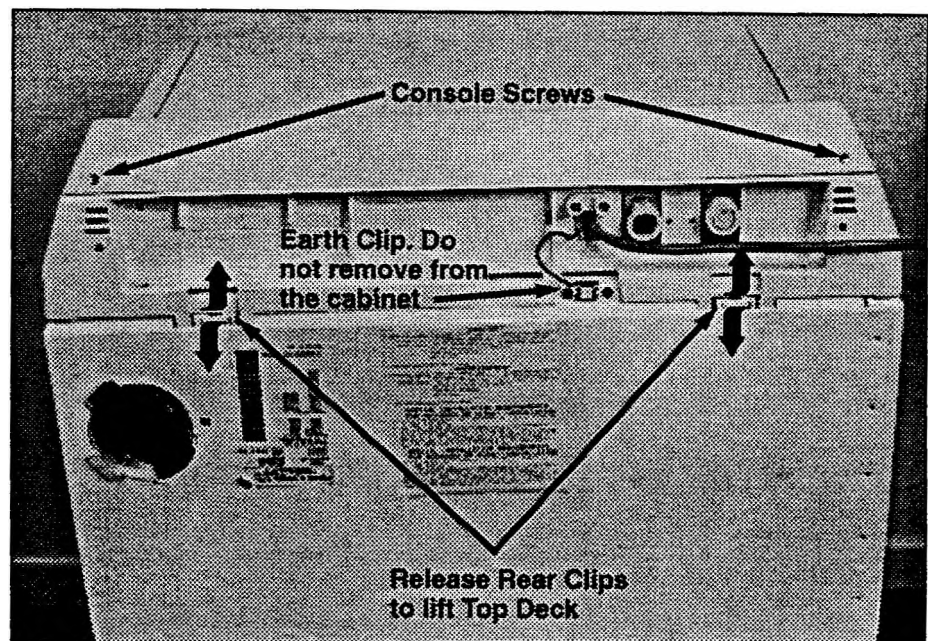
Access to Console Area - WARNING HIGH VOLTAGE

An anti-static wrist strap must be used when handling electronic modules and the Rotor Position Sensor. Clip the strap to the earth terminal at the rear of the top deck.

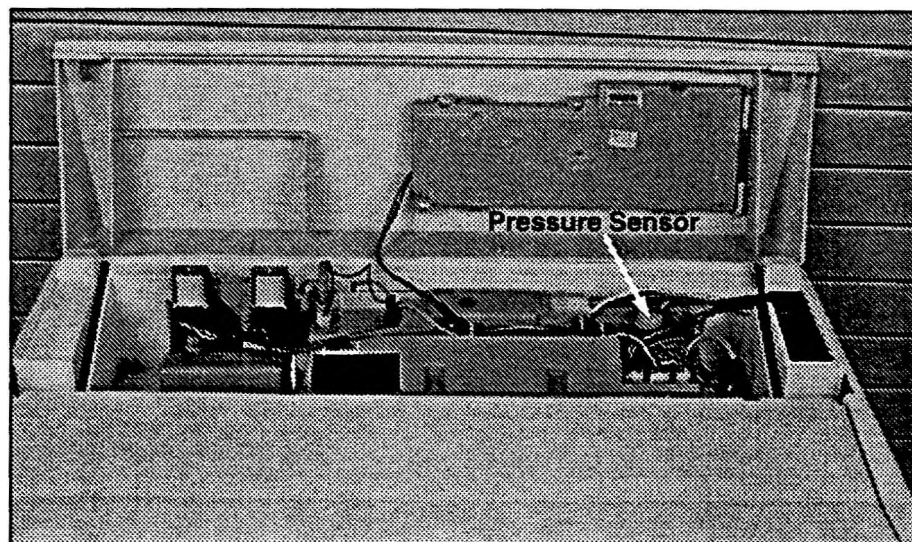
Modules removed from the machine for return must be protected from possible electrostatic damage (ESD) while in transit by the use of the specialised packaging in which they were received.

3. Remove the 2 screws from the rear of the top console, disconnect the earth lead. The console can now be raised for access to the Motor Controller Module, Display Module and associated wiring.

When removing the top deck, the rear clips must be released from the back of the cabinet and the top deck lifted upwards first.

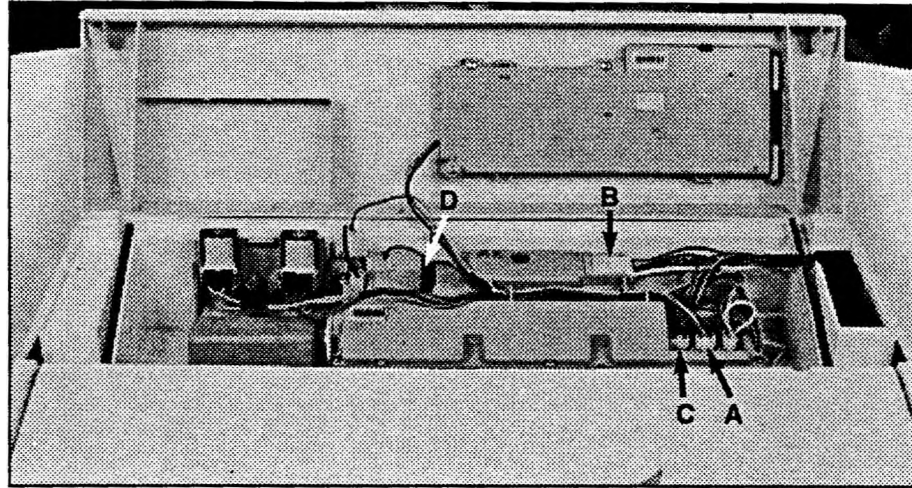


4. Disconnect the pressure tube from the pressure sensor.



5. Disconnect display module 3 way plug (A) from console. Disconnect the motor/pump harness plug (B), Rotor Position Sensor plug (C). Remove the pump earth lead and mains cable earth lead (D) from the Motor Controller Module. Remove the plugs from the back of the mains cable clamp, undo the 2 screws holding the clamp and remove the clamp from the console feed the mains cable earth wire through the cable clamp opening.

NOTE: DO NOT REMOVE THE EARTH CLIP FROM THE CABINET

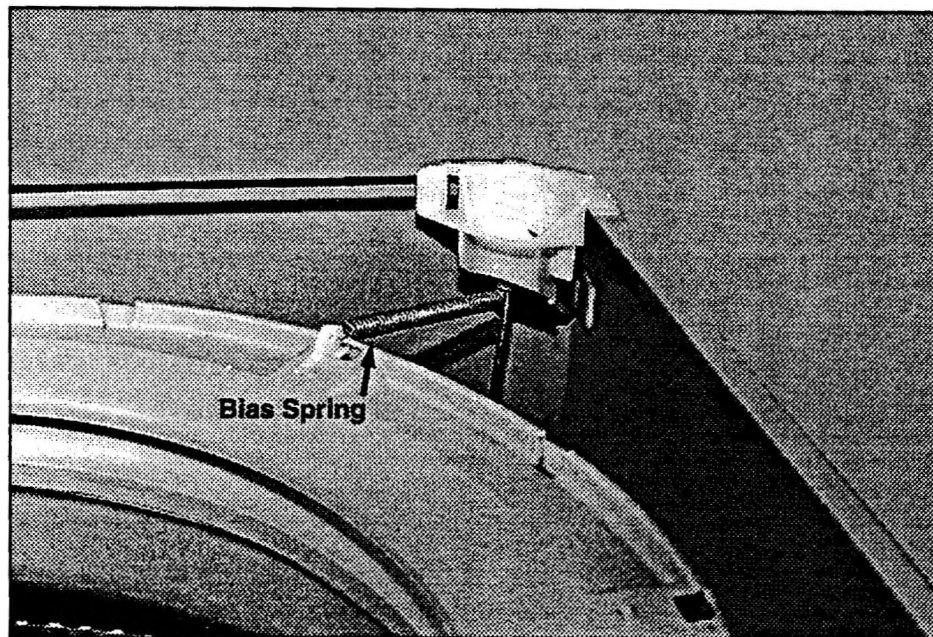


6. Remove the two rubber buffers and screws from the front of the top deck. Release the retaining clips at rear of cabinet using a flat bladed screwdriver. Lift the top deck clear, feeding wiring through hole in top deck corner of the cabinet.

Note:

The top deck cannot be hinged back without first releasing the rear clips from the cabinet and lifting at the same time. Refer diagram page 62.

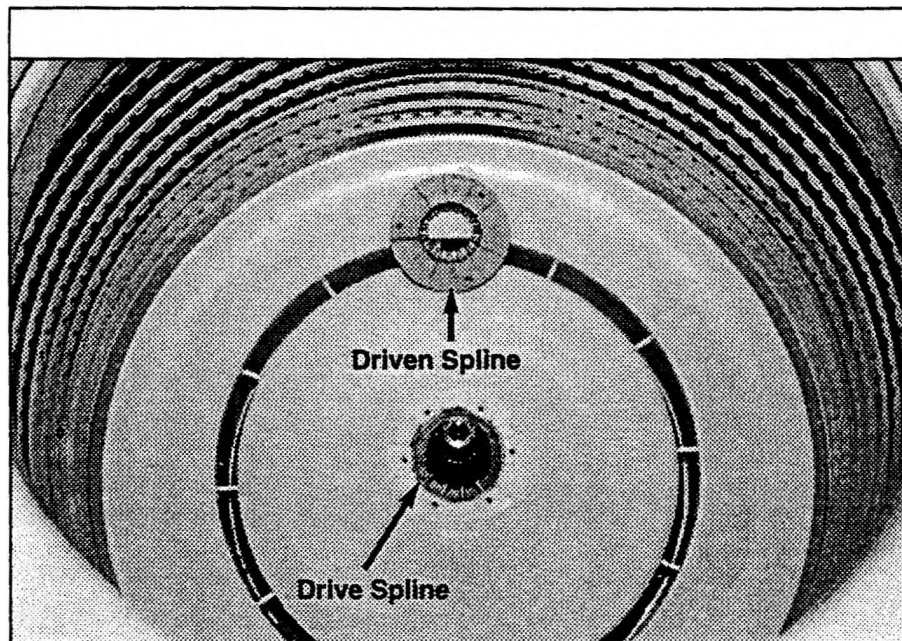
7. Unclip the bias spring from the front left suspension rod. Unclip the neck ring from the top of the outer bowl.



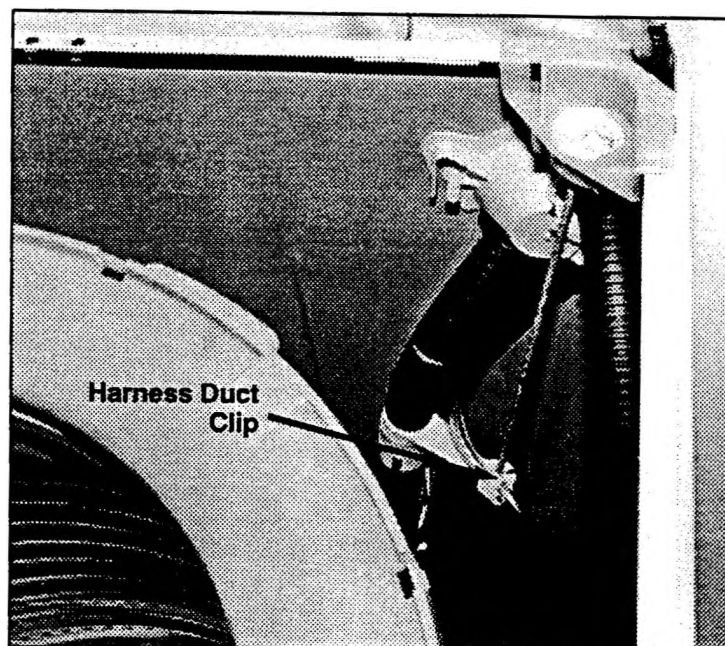
8. Remove the fabric softener dispenser, unscrew the agitator retaining nut and remove the agitator.

9. The inner bowl may now be lifted clear. (If the inner bowl is not easy to lift clear, then remove the three spline retaining screws and remove the driven spline. Then pull the drive spline off the shaft and lift out the inner bowl).

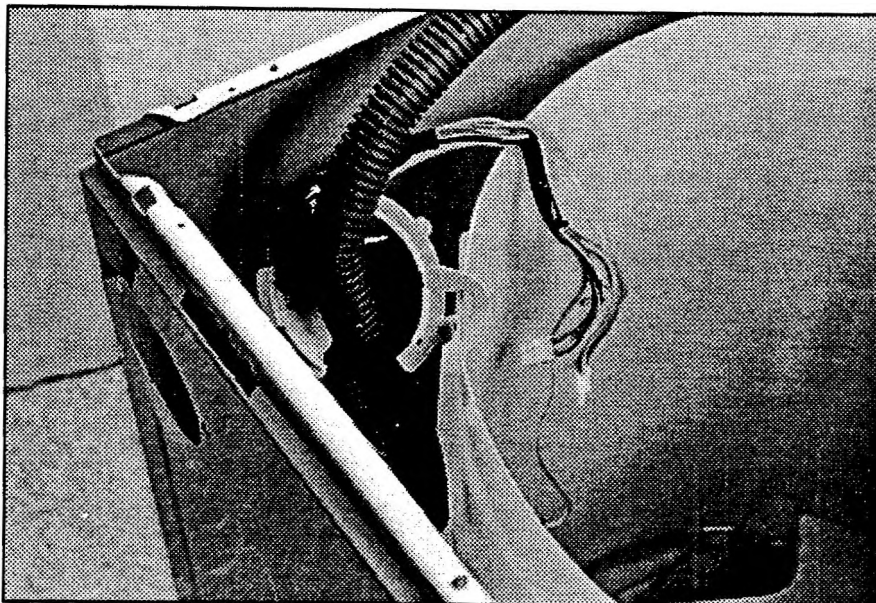
Note: If not already removed, the clutch can be disassembled at this stage by removing the three screws from the driven spline.



11. Remove the screw from the drain hose outlet bracket on the rear of the wrapper.
12. Unclip the harness duct from the right hand rear suspension and remove the suspension assembly by lifting the corner bracket upwards, and free the suspension assembly from the outer bowl.

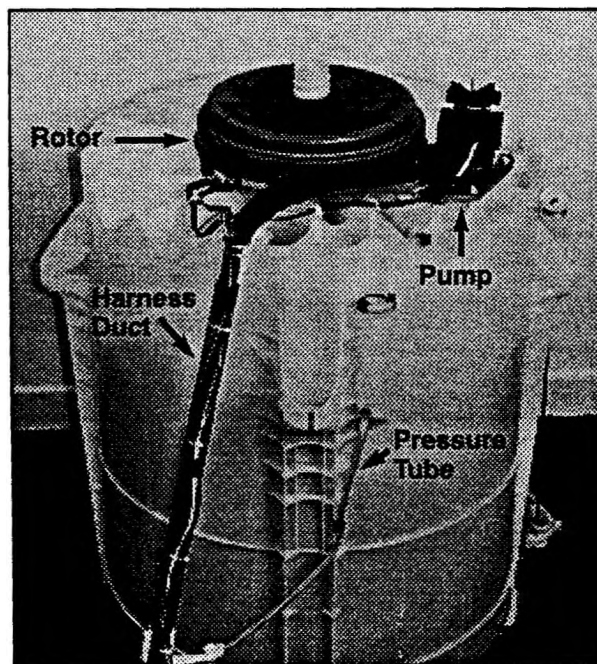
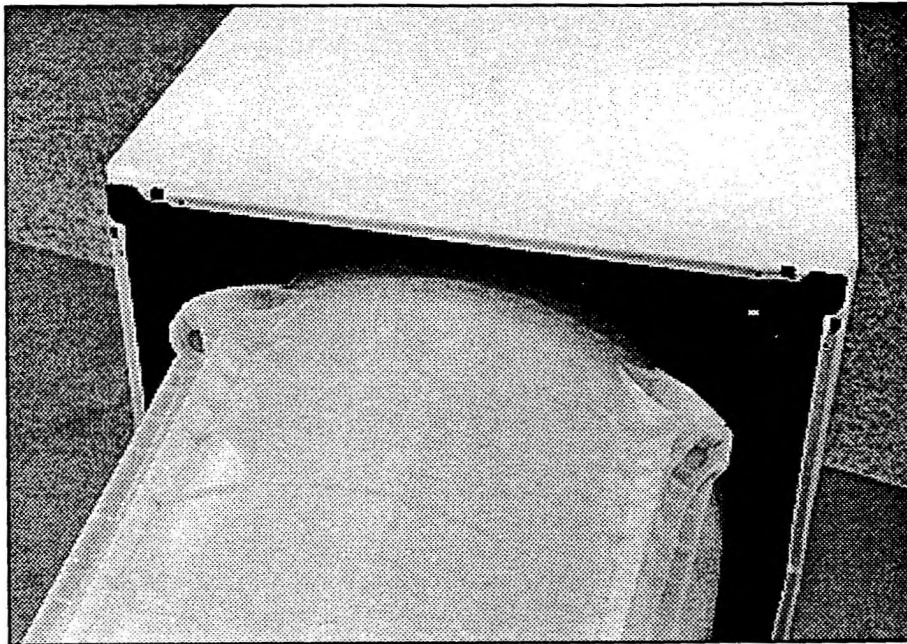


13. Feed the drain hose inside the wrapper. Clip the drain hose fixture over the outer bowl with the attached hook.



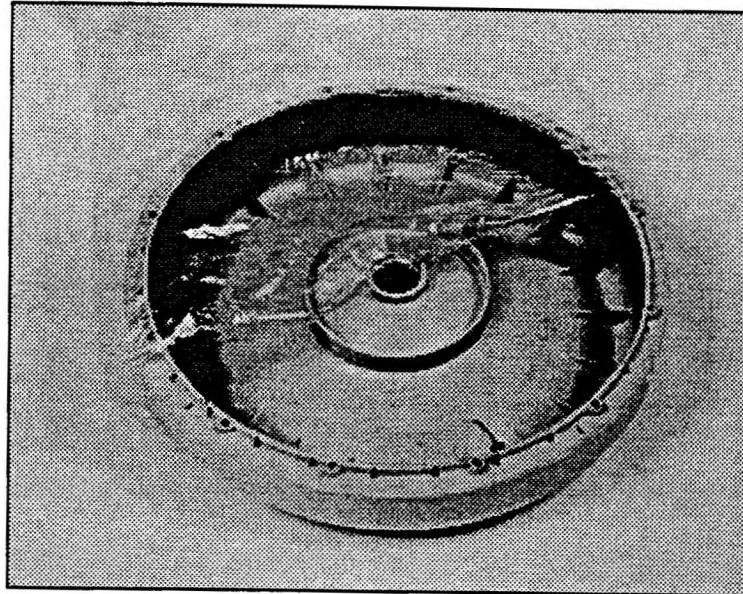
14. Remove the remaining three suspension rod assemblies.

15. The outer bowl can be lifted clear of the wrapper. Drain the water from the outer bowl, then invert the outer bowl, enabling servicing of the motor and pump. Alternatively lay the cabinet on its back, on protective material, and slide the outer bowl assembly out, but note that approximately 1 litre of water must be removed from the pump sump before laying the cabinet on its back.



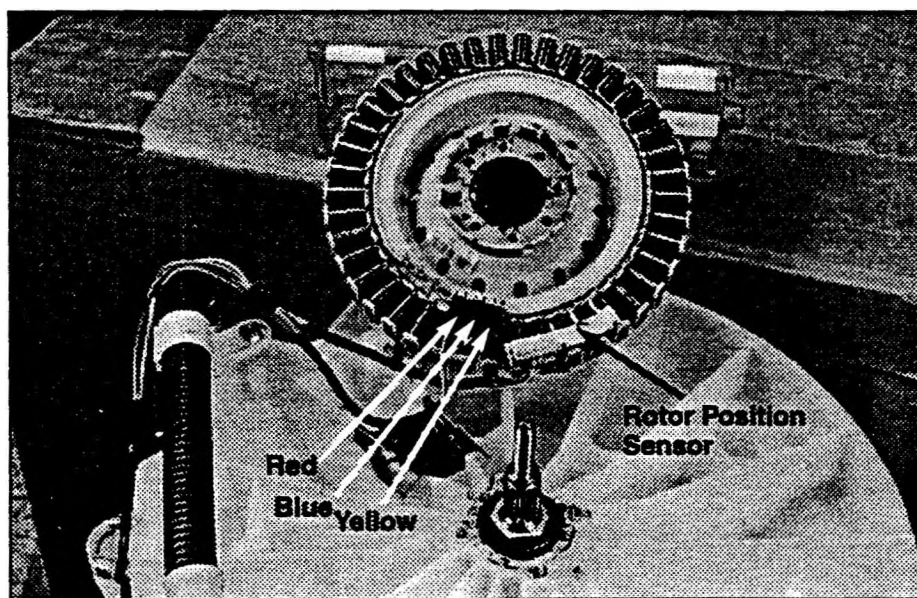
WARNING: Before removing the rotor, have a plastic bag or suitable clean container to place the rotor in to avoid contamination. The rotor has strong magnets and can attract metal objects. If a foreign object is caught in the rotor area it will cause the magnets to wear and create a fine black powder which will permeate through the whole appliance. If this happens, extreme care should be taken when cleaning the appliance. Avoid inhaling the dust and clean your hands thoroughly when finished.

16. Remove the rotor by using a 16mm or 5/8" socket. Lift the rotor clear, and place in a plastic bag.

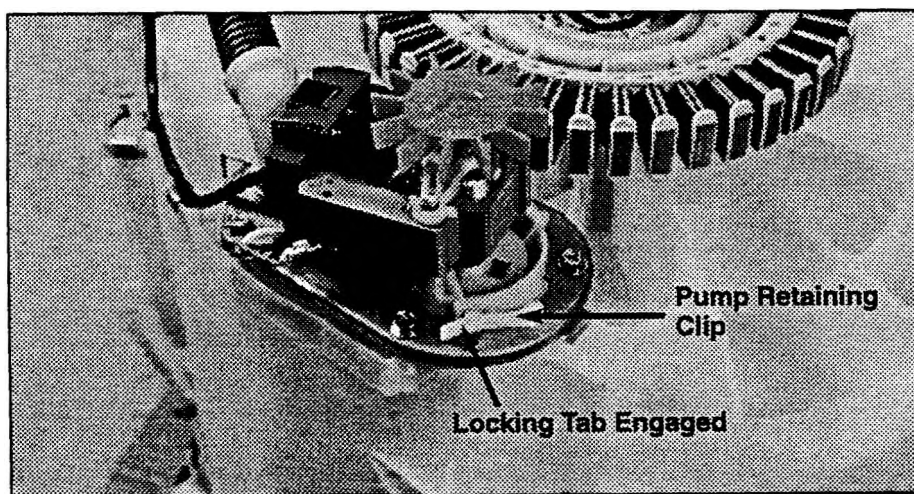


17. Unscrew the 4 bolts securing the stator to the outer bowl using a 3/8" socket.
18. Lift the stator clear of the shaft, turn over. Take note of the wiring connections, unclip the wiring.

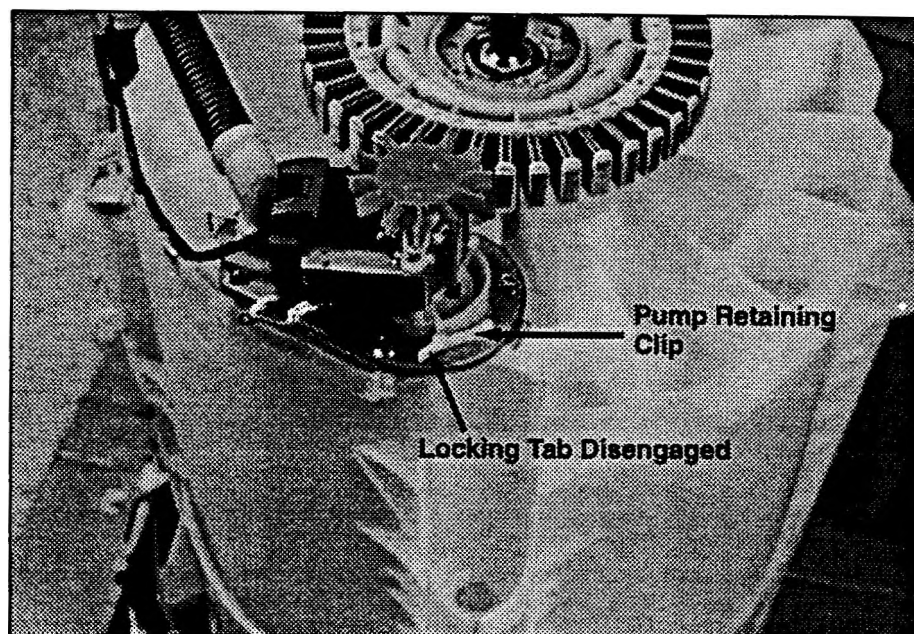
Note: When placing the stator on a work bench, ensure the rotor sensing board connections are facing upwards or damage can result. **Do not place the stator inside the rotor.**



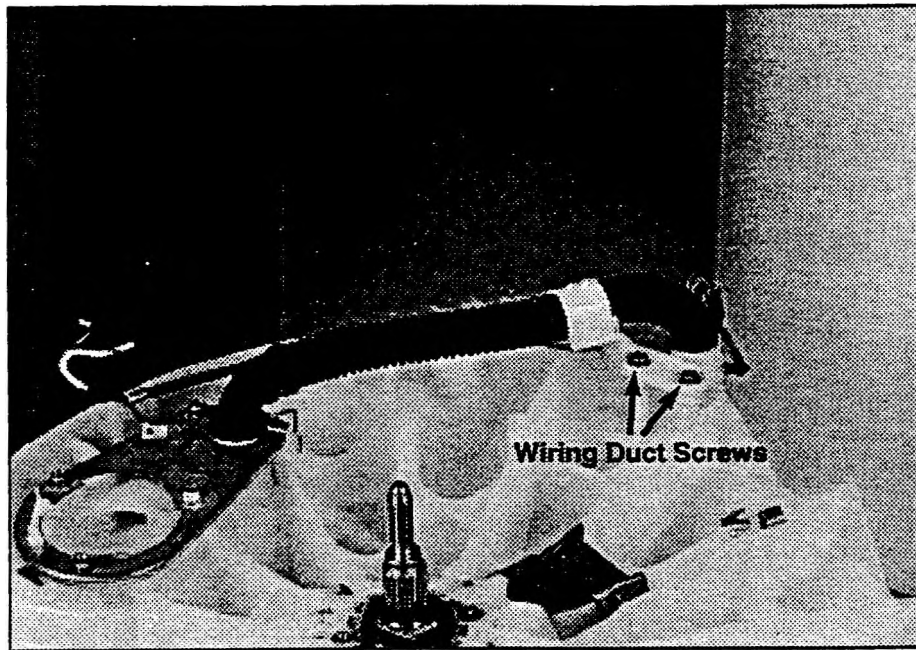
19. To remove the pump, release the locking tab.



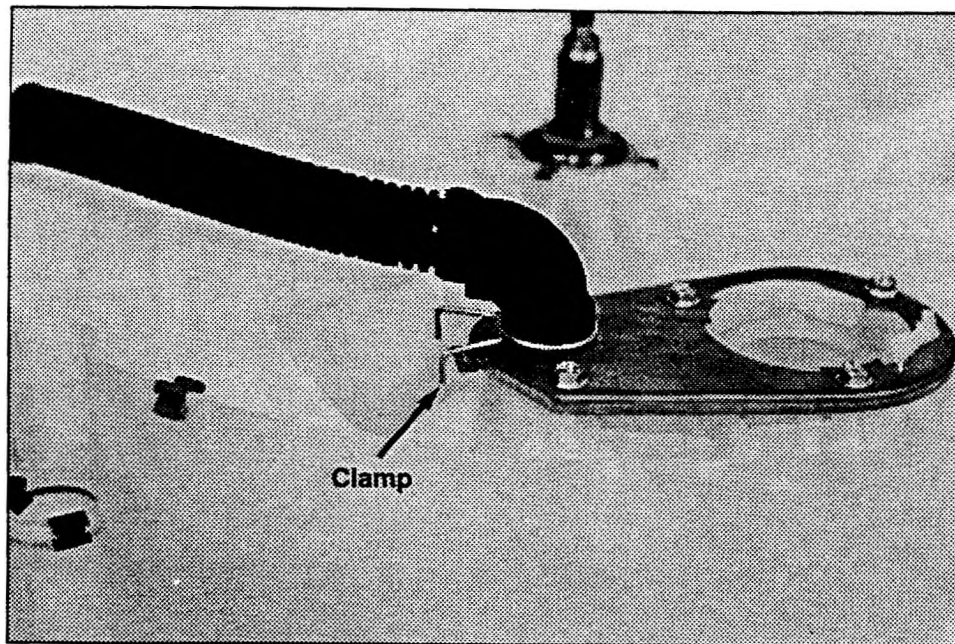
Turn the pump anti-clockwise, lift it clear and remove the three wiring terminals.



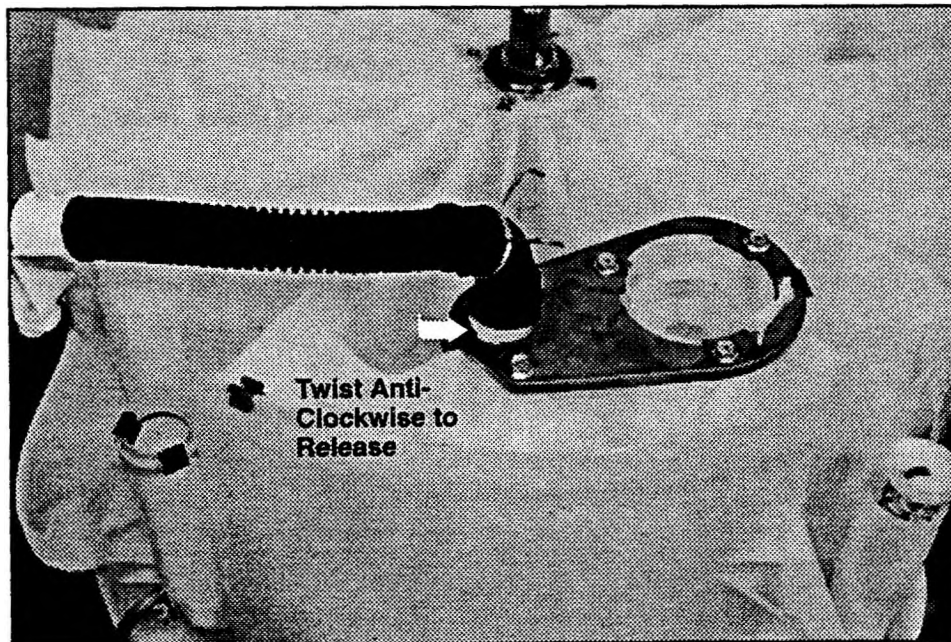
20. Remove the two screws securing the wiring duct to the outer bowl base.



21. Remove the drain hose clamp.



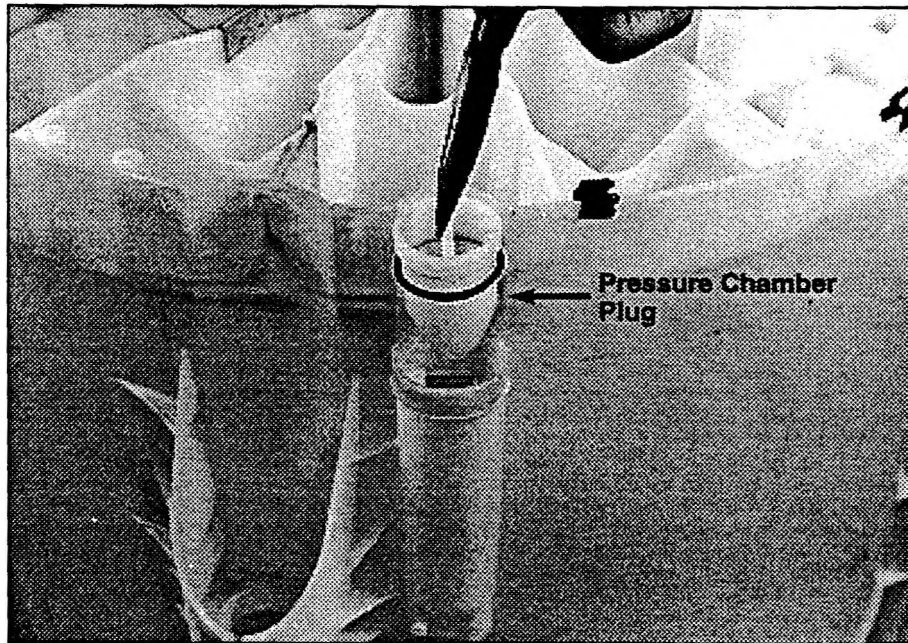
Twist the drain hose in an anti-clockwise direction to release the bayonet fitting.



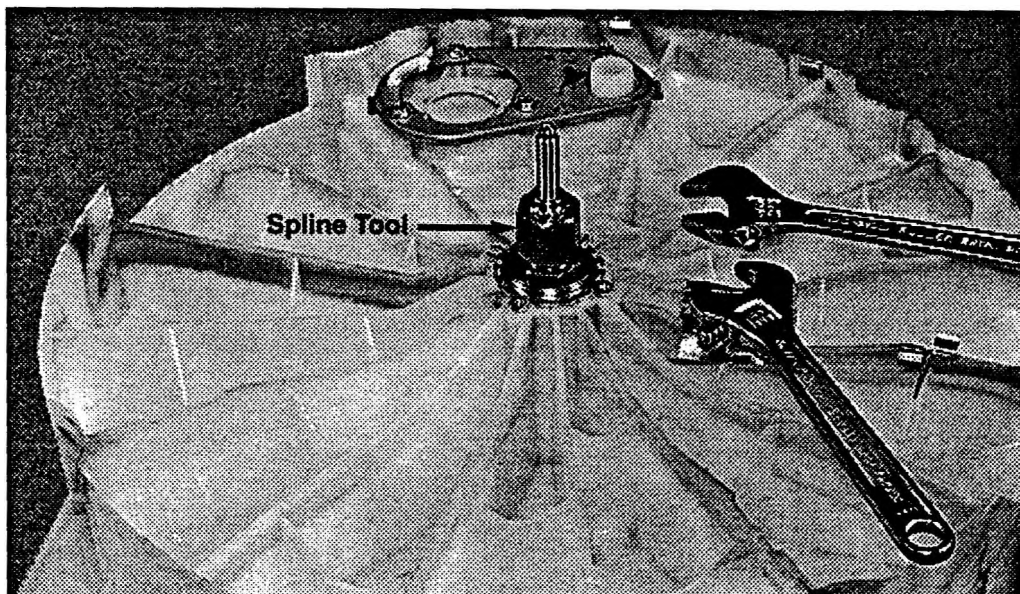
22. If changing the outer bowl, the pump securing plate can be removed at this stage by unscrewing the 4 x 3/8" securing bolts.
23. Remove the clamp from the pressure tube and pull the tube off the spigot on the pressure chamber. Unclip the pump harness and then remove the complete assembly.



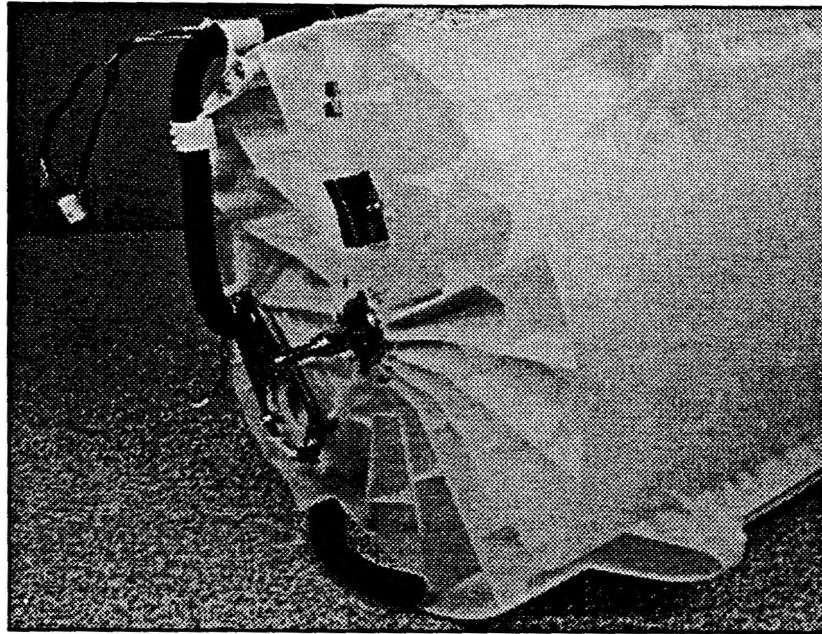
24. At this stage the pressure chamber can be inspected. Remove the clips then withdraw the pressure chamber plug.



25. Fit the spline tool over the shaft. Remove the 1 1/4" AF shaft retaining nut securing the shaft.

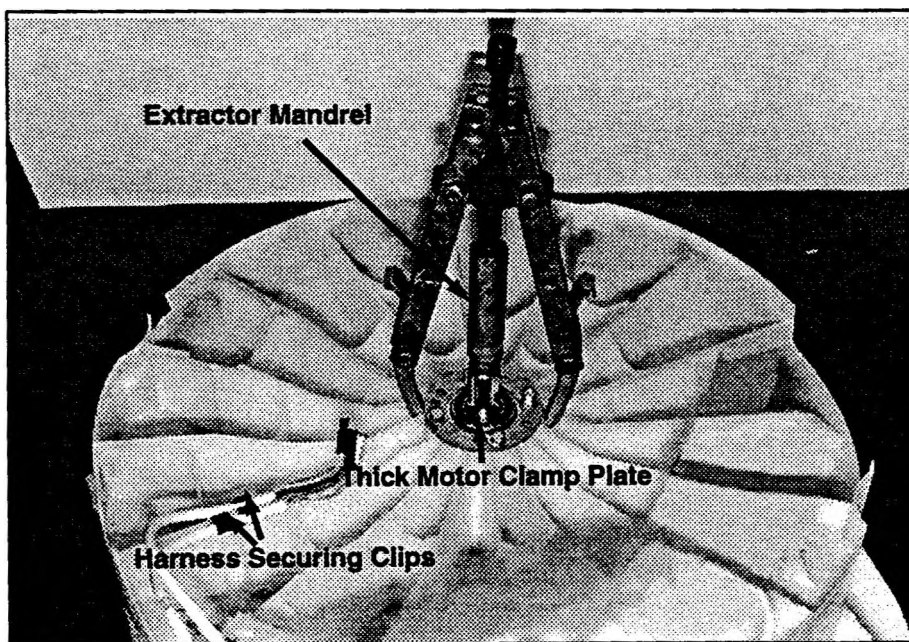


26. Lay the outer bowl on its side before removal of the shaft. This ensures that the shaft does not fall directly onto the floor.



27. **Note:** The shaft can be removed in one direction only, towards the inside of the outer bowl. Remove the shaft from the base. Should the shaft be difficult to remove, use pullers and mandrel. Refit the thick stator motor clamp plate onto the outer bowl and secure with the stator mounting bolts. Use the stator clamp plate to hold the legs of the pullers in place.

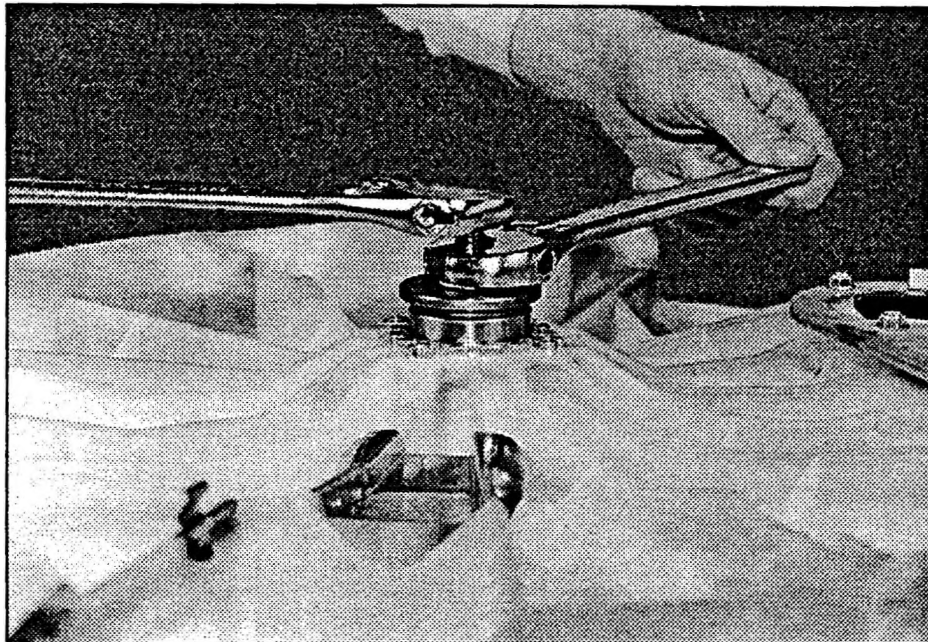
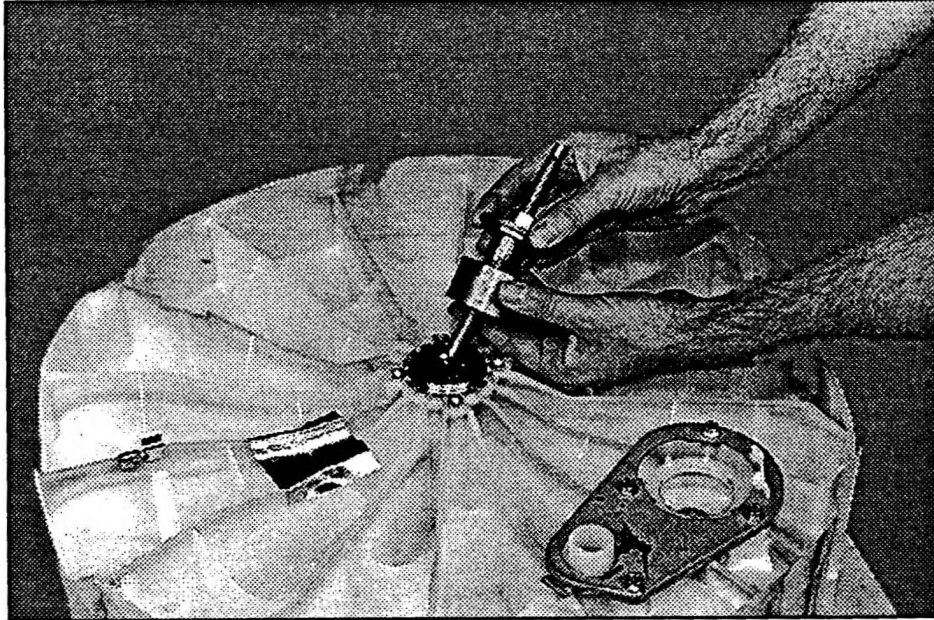
WARNING: Make sure the stator clamp plate is still flat before reusing. If in doubt, replace.



29. Remove the outer bearing using the bearing removal tool. (Refer diagram Section 12).

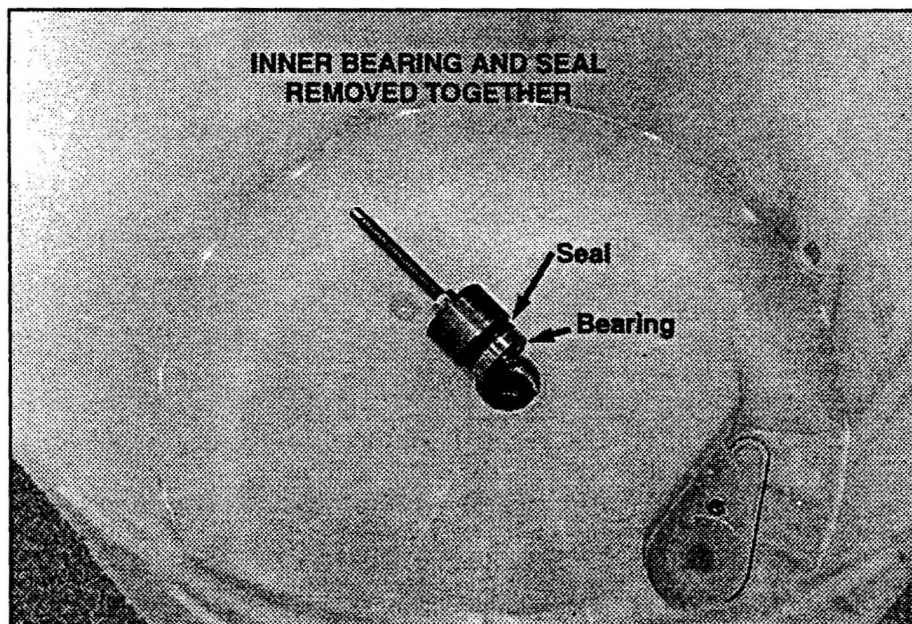
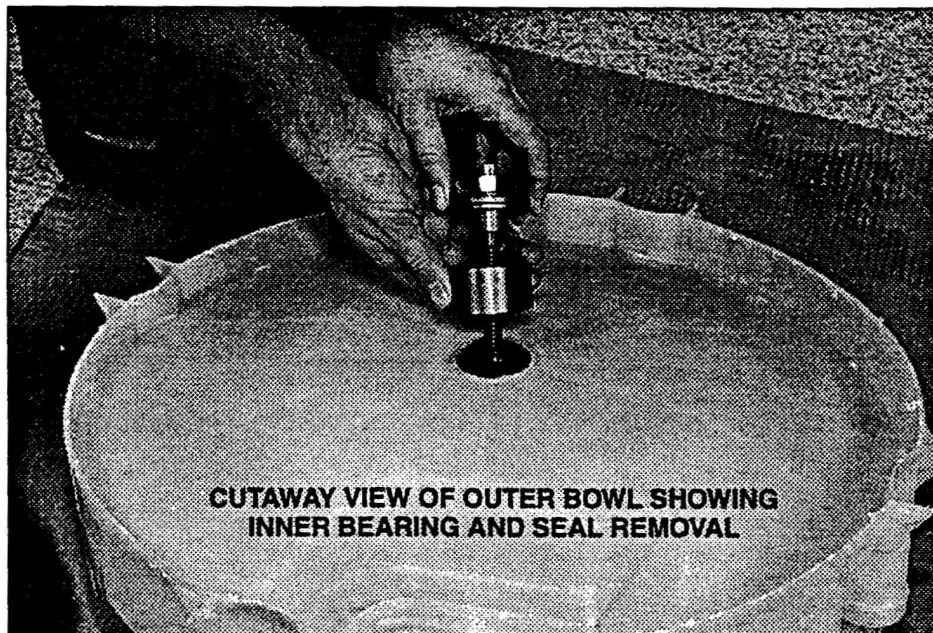
Warning: Do not remove the bearings with a hammer and drift as serious damage to the bearing housing or outer bowl could result.

Use the bearing removal tool as illustrated below.



30. Remove the seal and inner bearing together using the bearing removal tool.

Insert the threaded rod and extractor washer up from the bottom of the outer bowl. Then place the collar and large locating spigot on the threaded rod and extract the seal and bearing together.

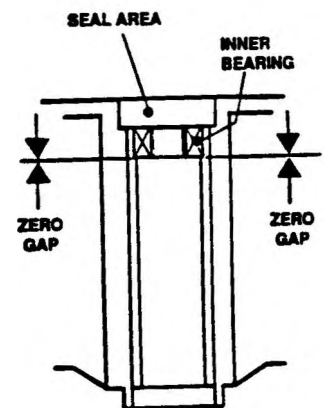
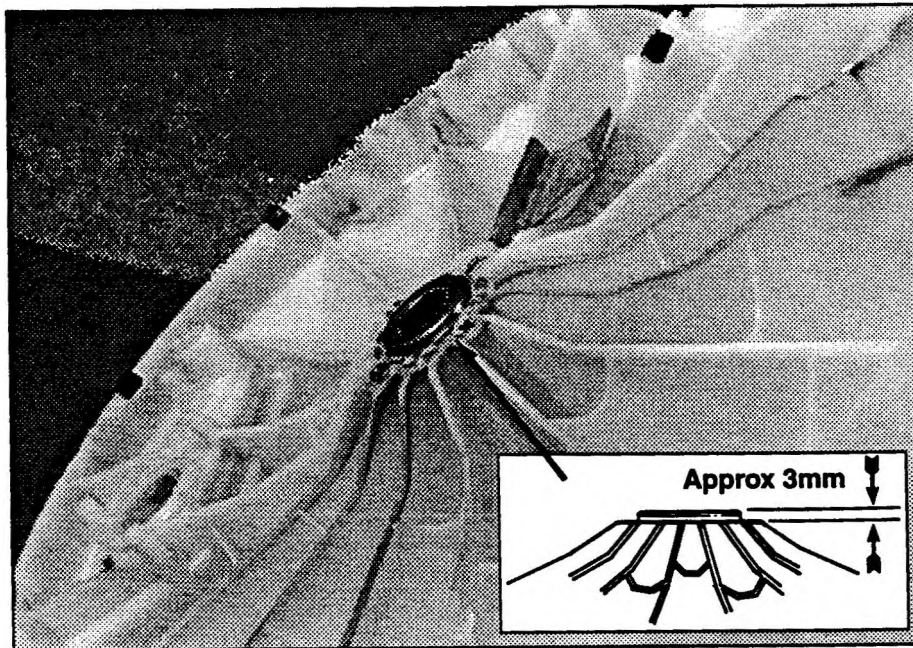


COMPLETE RE-ASSEMBLY SECTION 14

1. The bearings must be inserted separately with the **inner bearing fitted first** and pulled down with the bearing tool onto the shoulder in the bearing housing. **IMPORTANT:** There must be no gap between the bearing outer race and the shoulder of the aluminium extrusion. Remove the insertion tool at this point and check that the inner bearing is fully home.

Fit the bearing spacer and press in the outer bearing using the bearing tool. Check the spacer has no end float but has slight sideways movement to allow for shaft insertion.

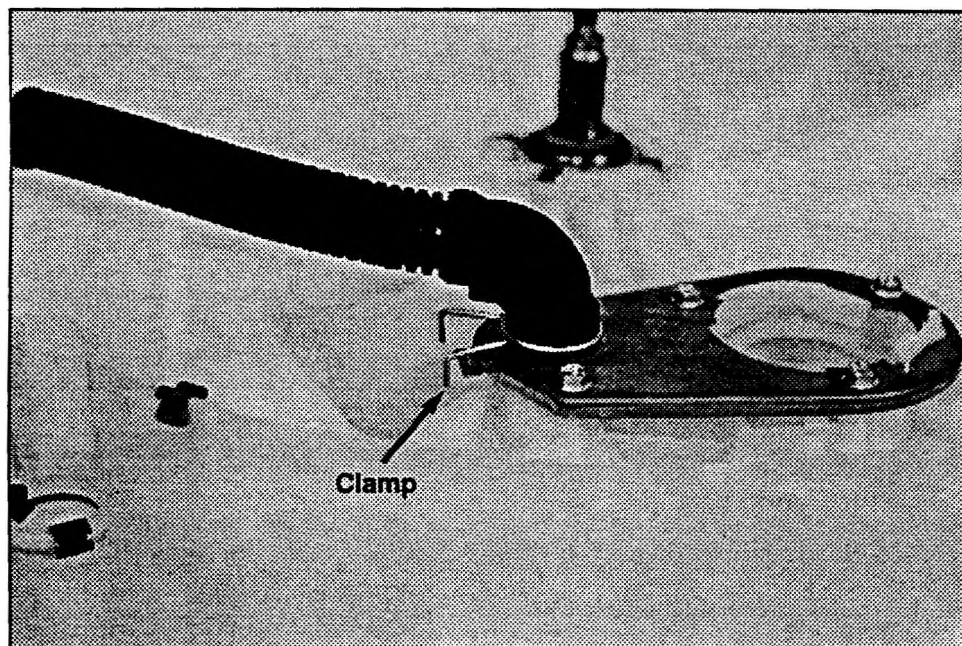
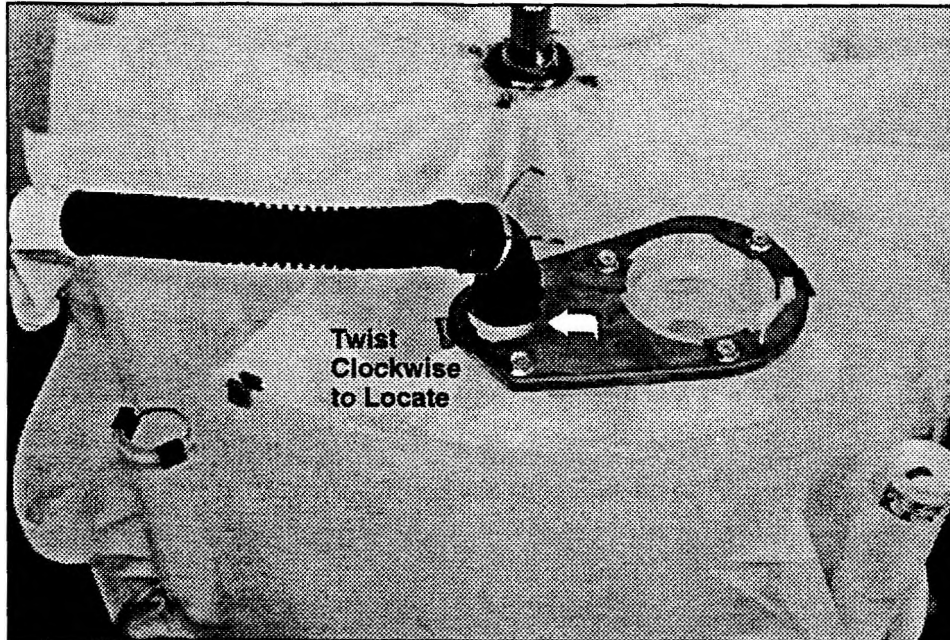
Note: The outer bearing will be proud of the housing by approximately 3mm. Refer diagram.



2. Ease the shaft through the bearings from inside the outer bowl. Take care the shaft is fitted with the threaded retaining nut section facing downwards in the direction of the base.
3. Fit the shaft retention nut. Use the spline tool and spanner to tighten the shaft retention nut.
4. Invert the outer bowl. Take care not to damage the shaft or flooring.. **Fit the assembly thimble sleeve onto the shaft before fitting the seal.** Lubricate the seal outside diameter with liquid detergent and then slide into position by pressing down on both sides of the seal.

Note: The seal should be flush with the lip on the base of the outer bowl.

5. Fit the pump motor bracket and clip (if removed).
6. Refit Drain Hose Outlet to the base.
Note: Ensure the lugs on the elbow are located underneath the pump bracket. Clamp into position.

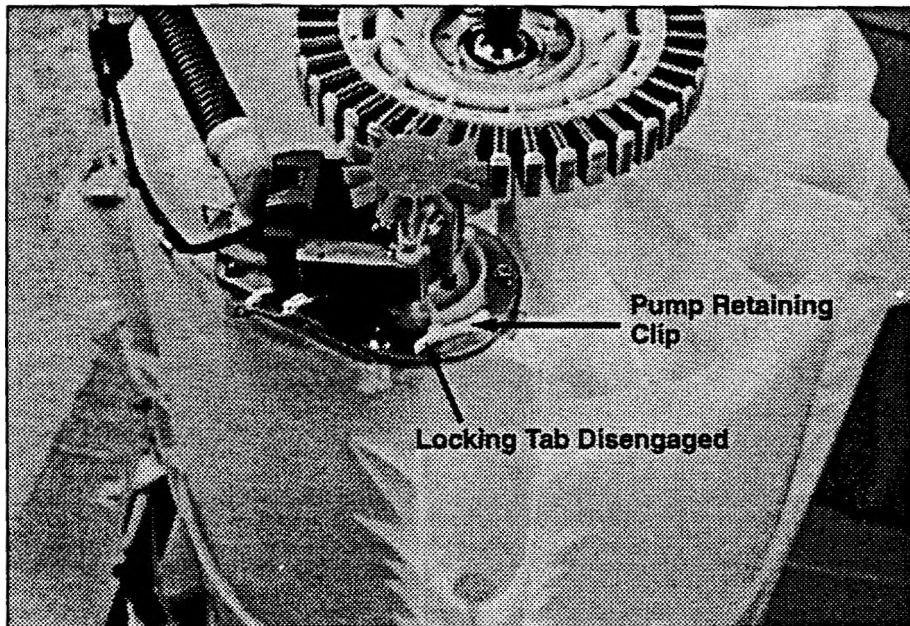


7. Secure the wiring/drain duct assembly onto the outer bowl using two screws.

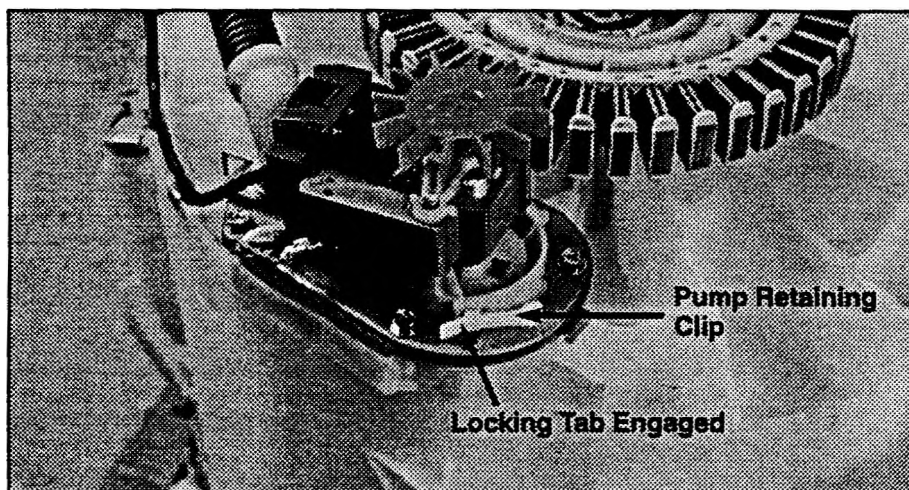


8. Connect the wiring to the pump motor before fitting to the bracket.
Note: The terminals on the pump motor are angled.

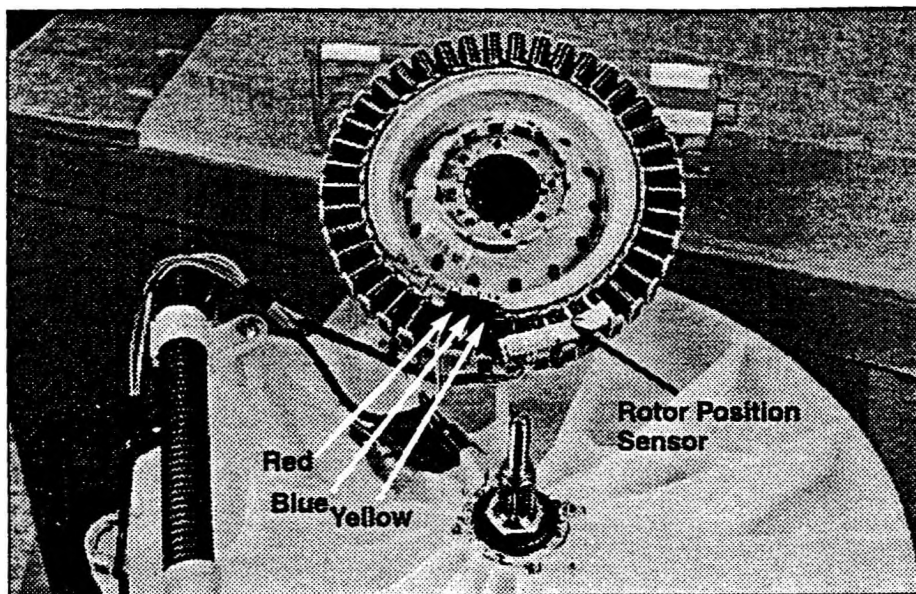
9. Turn the pump motor clockwise when refitting it into the bayonet fixture. Check that the locking tab has clicked into place.



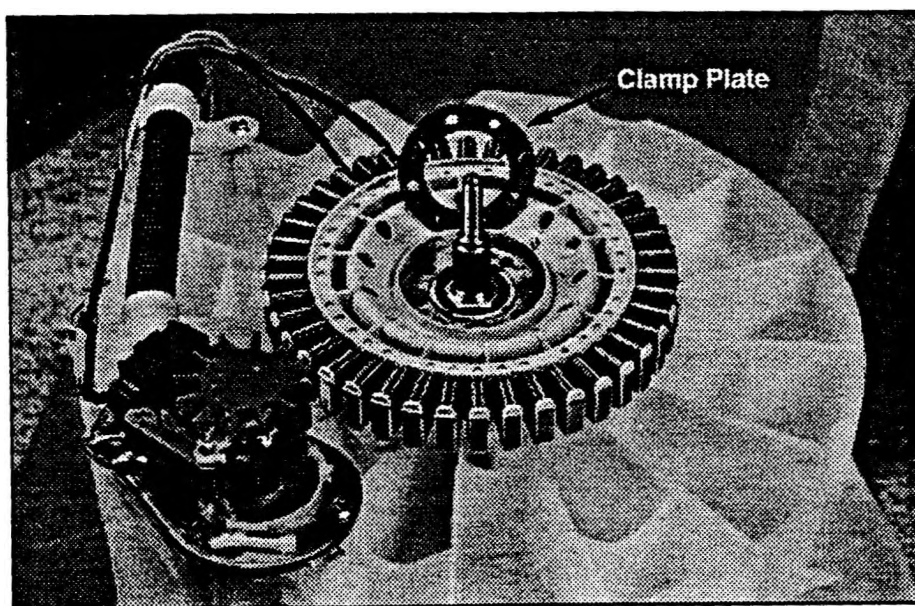
Clip the pump harness into the securing clips.



10. Wire up the stator before locating the stator into position. **CHECK** that the wiring is correct.

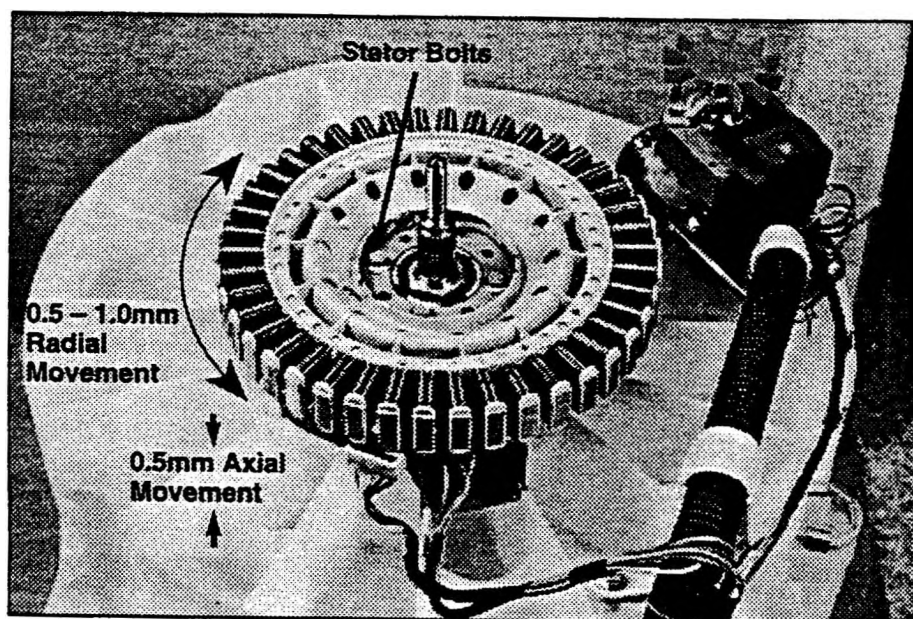


11. Grease the stator side of the clamp plates and around the inside section of the stator that fits over the bearing. Fit the clamp plate and spacer assembly to the back of the stator. Locate the stator into position. It will only fit in one position.

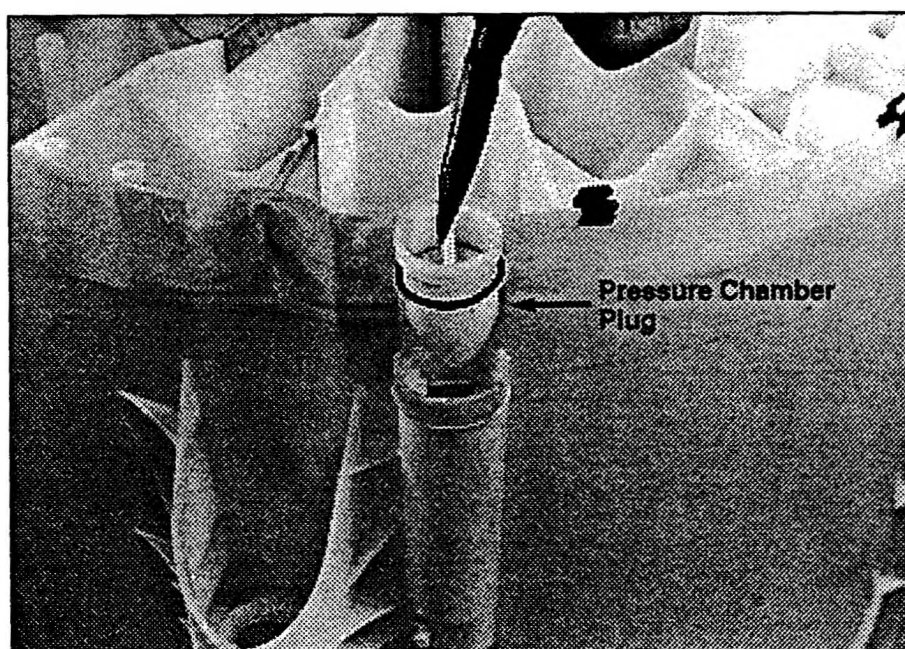


12. Refit the clamp plate onto the stator and tighten the four 3/8" bolts to a torque of 5 nm.

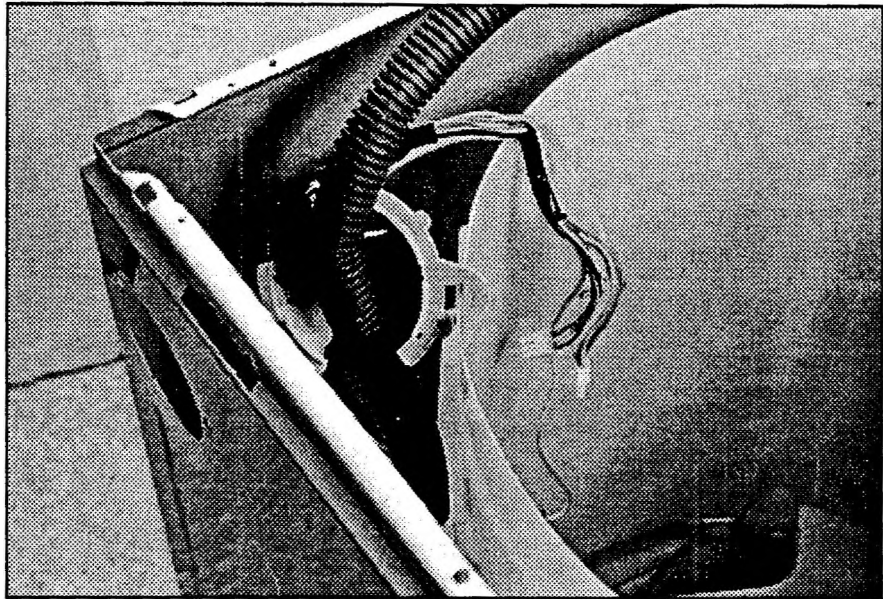
Note: The stator should have some slight radial movement on the resilient mounts of approximately .5 - 1mm when correctly tightened as shown by the arrows on the diagram below, and should have minimal axial play (rocking movement) of .5mm maximum.



13. Fit the wiring harness into the securing clips.
14. Fit the rotor onto the shaft and locate on the spline. Using a 16mm socket, tighten the plastic nut to a torque of 16 nm. Hold the rotor stationary until it is secured.
Note: Care should be taken not to catch fingers between the rotor and the stator.
15. To refit the pressure chamber plug, moisten the O Ring with water and push into position (stepped section facing toward the tub). Refit the retaining clips.



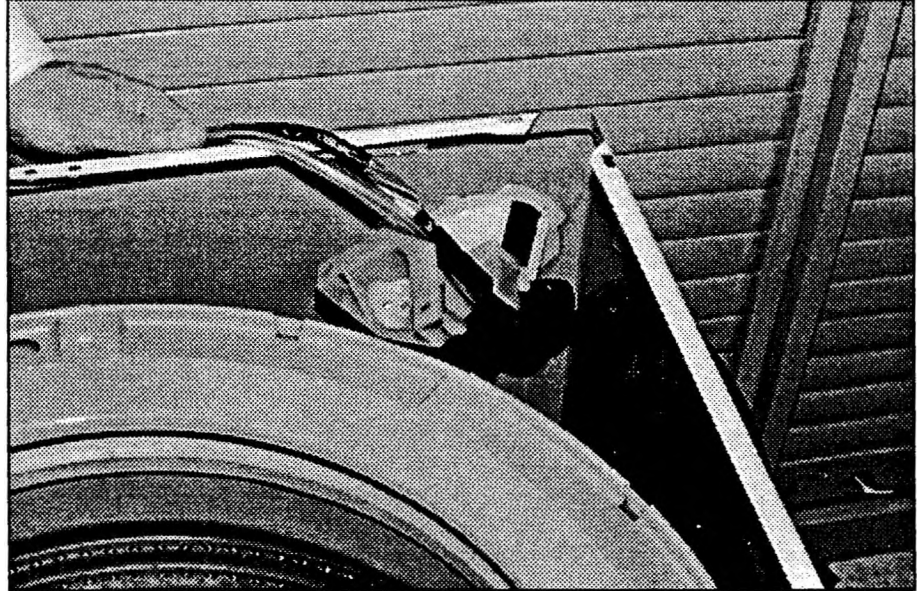
16. Refit the pressure tube and clamp.
17. Clip the hook on the drain hose fixture over the rim of the outer bowl.



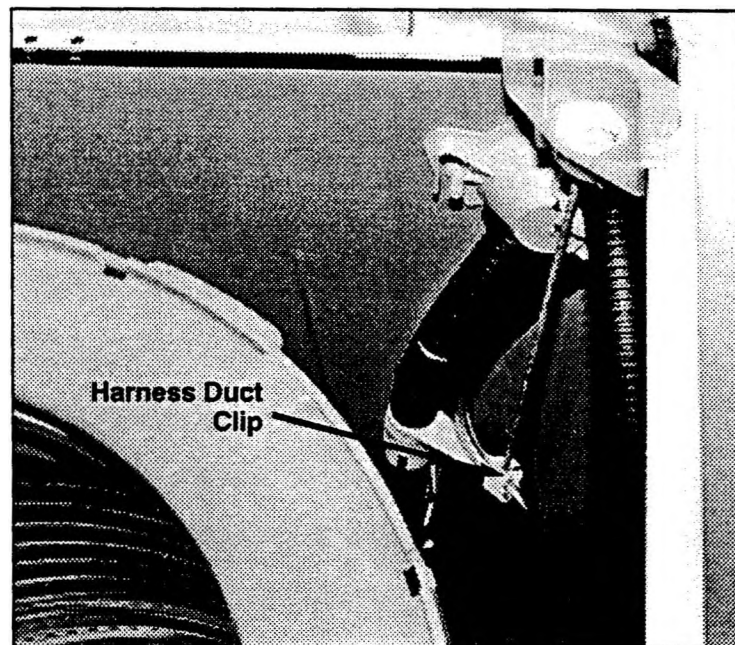
18. Lift up the outer bowl and place inside the cabinet wrapper.
19. Thread the drain outlet hose through the hole in the rear of the cabinet wrapper.
20. Clip in place the right front and back left suspension assemblies.
21. Unclip the drain hose fixture from the lip of the outer bowl and screw into position on the cabinet. Ensure the drain hose grommet is correctly fitted.

22. Clip the right rear suspension assembly onto the outer bowl. Locate the wiring and pressure tube into the corner bracket as shown below, then clip the corner bracket into place.

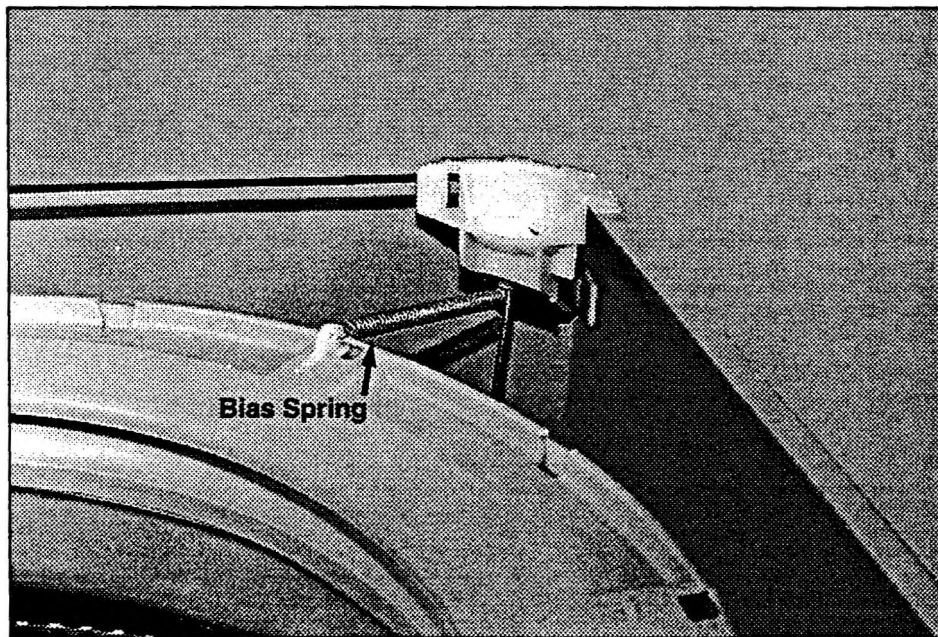
NOTE: Check that the wiring does not cross and that the pressure tube is not pinched.



23. Clip the harness duct to the suspension rod.
Check that the wiring clip is fitted to the drain hose fixture.



24. Refit the front left suspension assembly.
25. Refit the drive spline and driven spline to the inner bowl.
26. Lift the inner bowl into place, slide into position and rotate to ensure that the clutch and spline are located into place. Then push the bowl fully down.
27. Refit the agitator, secure with the agitator retaining nut and hand tighten. Check the inner bowl clutch engagement/disengagement by lifting and rotating the inner bowl. Then refit the fabric softener dispenser.
28. Refit the neck ring with the bias spring holder in the left hand front corner. Clip into place.
29. Refit the bias spring.

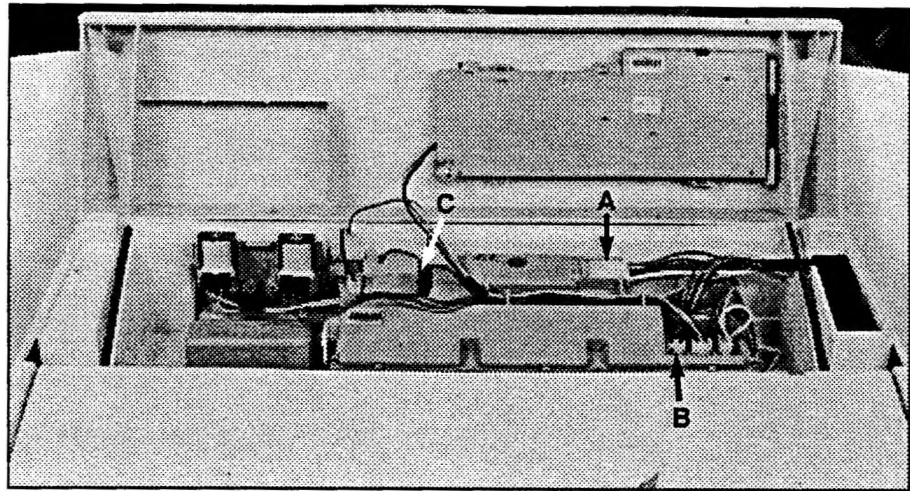


An anti-static wrist strap must be used when handling the electronic modules and the Rotor Position Sensor. Clip the strap to a suitable earth connection.

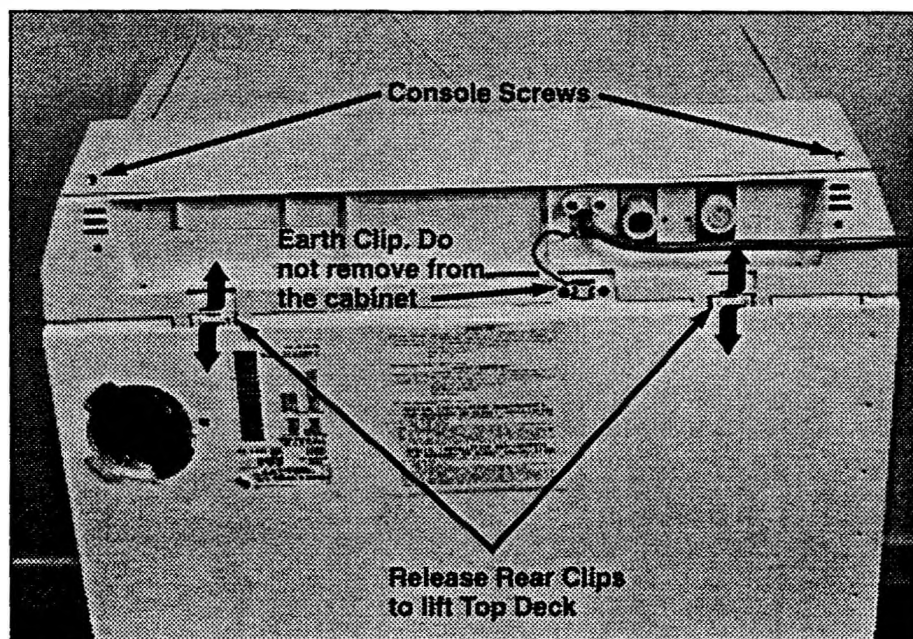
30. Engage the rear top deck tabs into the wrapper, then hold the top deck up. Thread the wiring and pressure tube through the top deck opening. **Take care** to ensure that the bowl is pulled clear of the out of balance lever before lowering the top deck into position. **CHECK THAT THE LOOM AND PRESSURE TUBE ARE NOT KINKED** before refitting the top deck. Blow down the pressure tube to check if it is clear.

31. Reconnect the wiring connections onto the appropriate components. Motor/Pump harness plug (A), Rotor Position Sensor plug (B) pump earth and mains cable earth (C) Reconnect the mains cable clamp and secure with screws.

Note: ENSURE THAT THE WIRING INSTALLATION IS CORRECT. Refer to diagrams below.



32. Refit the pressure tube and clip onto the pressure sensor.
33. Refit the console ensuring that the gasket is in place.
34. Secure the console using two screws.



35. Secure the top deck into position by fitting the two screws into the front, then fit the buffers.
36. Refit the lid.
Carry out basic diagnostic tests (refer Section 11.8) then fill the machine to the high water level and check for any leaks. Inspect through the front hatch.

SELECTED AREAS OF SERVICE

Selected Areas of Service	SECTION
Pump Blockage	15.1
Complete Pump Failure - Burnt Out	15.2
Motor	15.3
Clutch	15.4

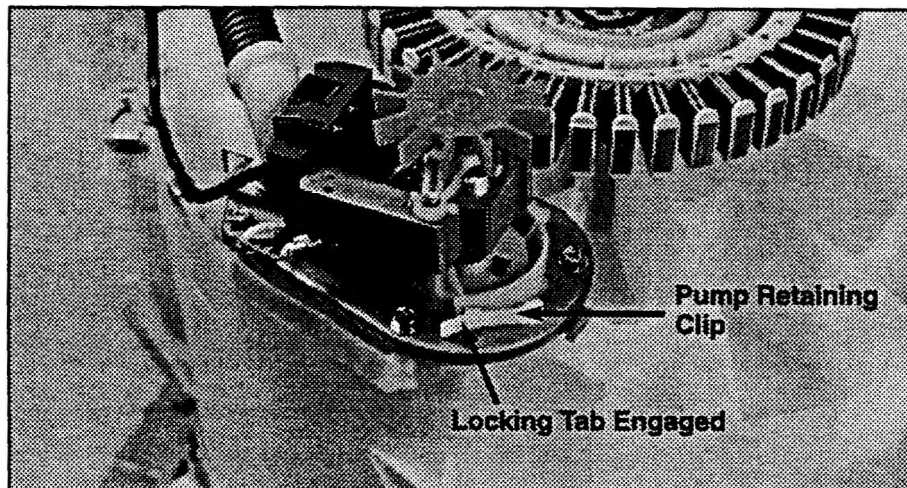
15.1 Pump Blockage

Always refer to the electronic diagnostics on the control panel for any fault symptom.

- a) Remove the front inspection panel by inserting a flat bladed screw driver into the slot and turn anticlockwise 1/8 of a turn. Pull outwards and remove.
- b) Advance to SPIN and attempt to flick start the fan on the pump motor. If the pump will not start, refer Section 15.2. If the pump starts, wait until empty, then unplug the machine from the power supply and remove the pump. To remove the pump, turn it towards the front of machine until the locking tab prevents further turning, then release the locking tab by pulling it away from the pump. Continue to turn, the pump will disengage. Check the pump cavity is clear of any debris.

NOTE: Approximately 1 litre of water remains in the pump sump after pump out and will spillout when the pump is removed.

It is not necessary to disconnect the wiring from the pump. However make sure the machine is isolated from the power supply. There is a 230V AC at the pump terminals the whole time the machine is switched on at the power point.

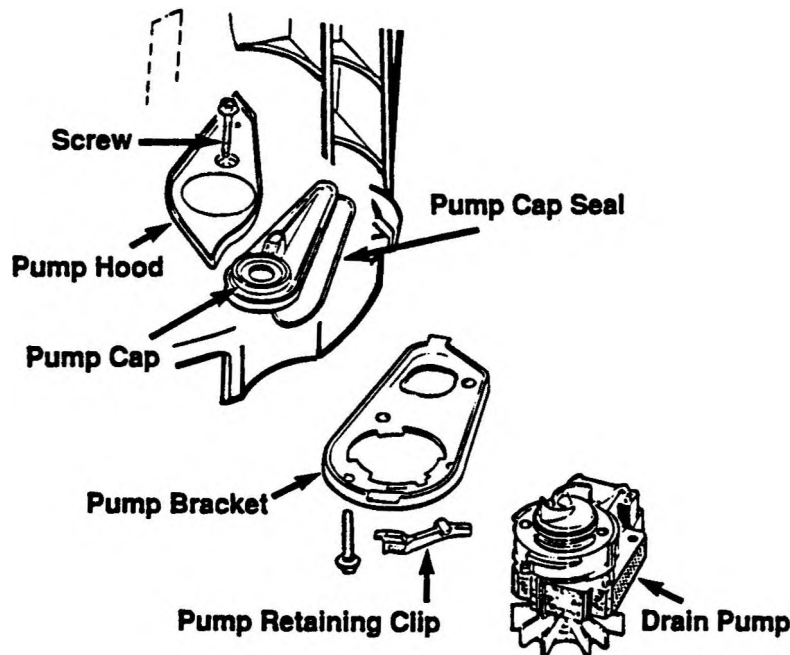


- (c) Refit the pump, making sure that the bayonet fixture is located correctly. Twist the pump away from the front of the machine until the locking tab clicks into place.
- (d) If unable to flick start, remove the lid, remove the agitator, and empty the water from the inner bowl. Remove the two inlet hoses and the earth screw from the rear of the top deck. Remove the rubber buffers and two front top deck screws, tilt the top deck back. **Do not** exert too much pressure on the top deck locating tags. These can be eased out of the wrapper if necessary. Rest the top deck against the wall.

Note: Care must be taken not to damage the out of balance lever.

Remove the bias spring, neck ring and inner bowl. Empty any remaining water and then remove the pump hood and pump cap. Check and clear blockage.

To reassemble:



- (i) Ensure that the pump cap seal is undamaged and in position on the pump cap. Replace the pump cap and pump hood. Do not overtighten the screw (2.5nm maximum).
- (ii) Lift the inner bowl into place, slide into position, and rotate it to ensure that the clutch and spline are engaged into place. Push the inner bowl fully down.
- (iii) Refit the agitator, secure with the agitator retaining nut, and hand tighten. Check the inner bowl clutch engagement/disengagement by lifting and rotating the inner bowl. Refit the fabric softener dispenser.
- (iv) Refit the neck ring and bias spring. Lower the top deck, refit the front screws and buffers. Ensure that the top deck tabs are fully engaged in the cabinet. Refit the lid and reconnect the hoses.

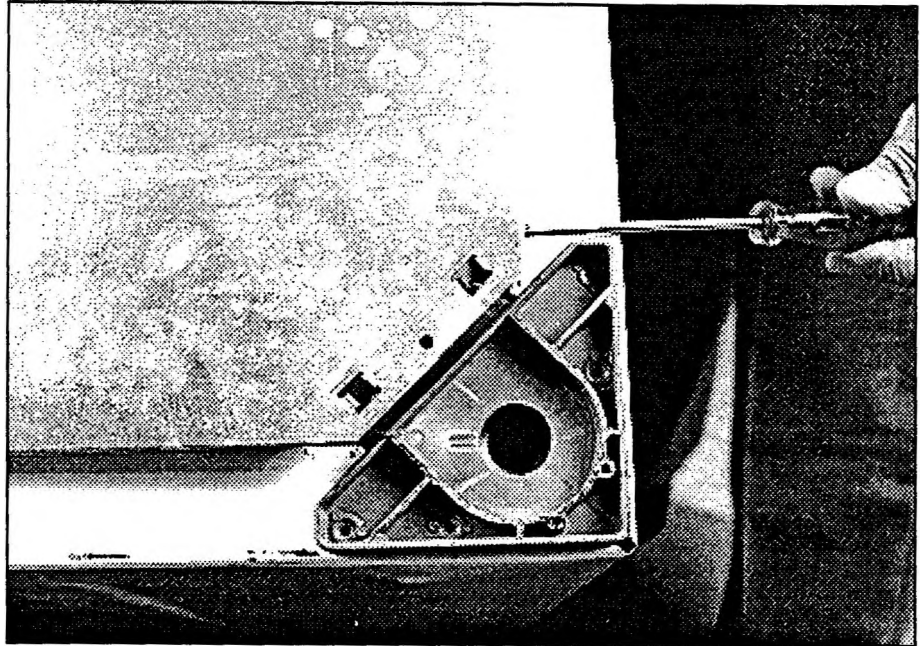
15.2 Complete Pump Failure - Burnt Out

Empty the water as stated above. Use steps as for pump blockage. Refer Section 15.1 for pump removal. Use a small container to remove as much water as possible from the bottom of the sump before removing the pump.

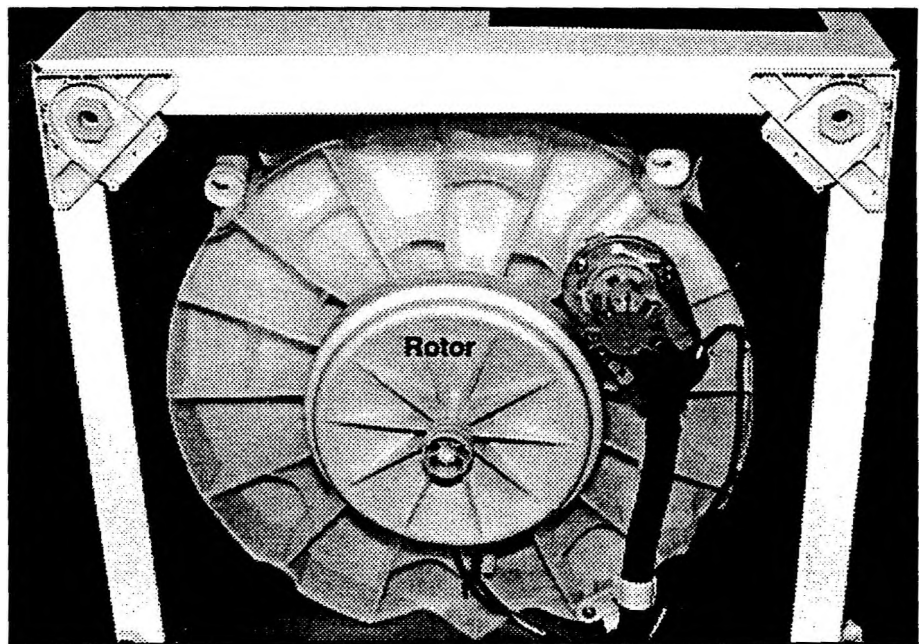
15.3 Motor

Removal of the motor can be achieved as follows:

- (a) Disconnect from the power and water supplies.
- (b) Feed the drain hose back through the top hole in the drain hose fixture.
- (c) Lay the machine on its back on protective material. Ensure that the machine is slightly raised on the top edge to prevent residual water in the bowl from spilling out.
- (d) Remove the base panel by easing the tabs, located at each corner, with long nosed pliers, then lever the panel off using a flat bladed screwdriver.

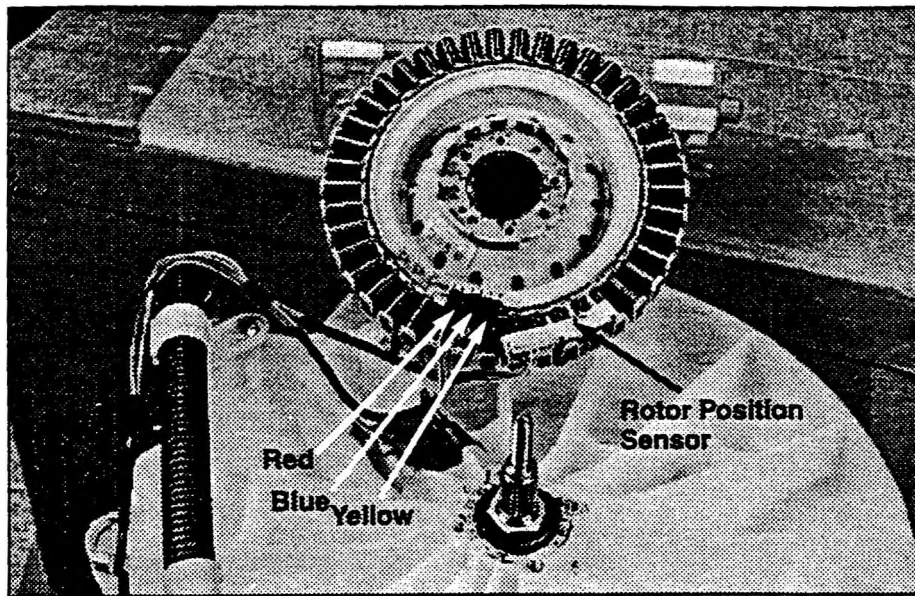


- e) Unscrew the rotor using 16mm or 5/8" socket and place it in clean plastic bag.
- f) Unscrew the 4 bolts securing the stator using a 3/8" socket.

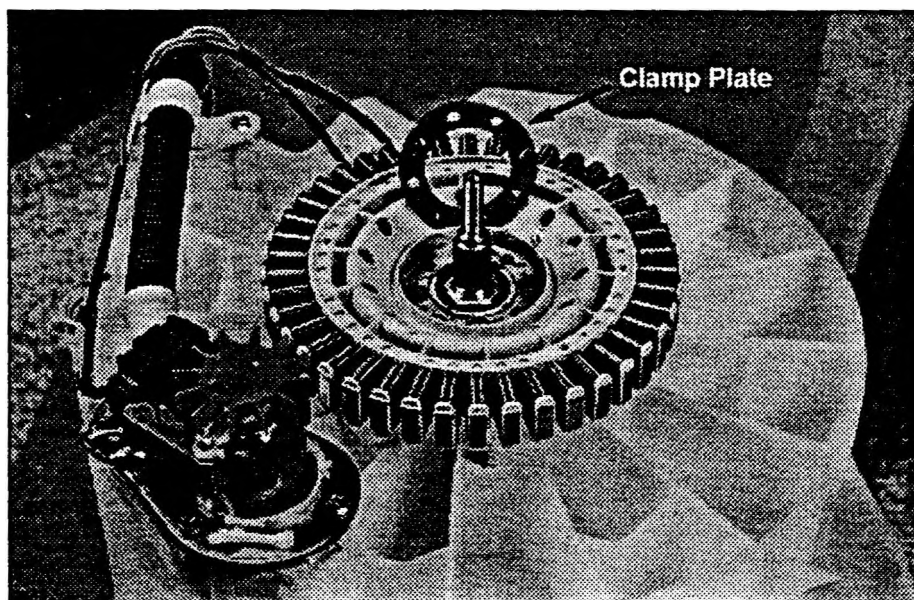


- g) Remove the stator and unclip the wiring.

- h) To refit motor. Wire up stator before locating stator into position. CHECK wiring is correct.

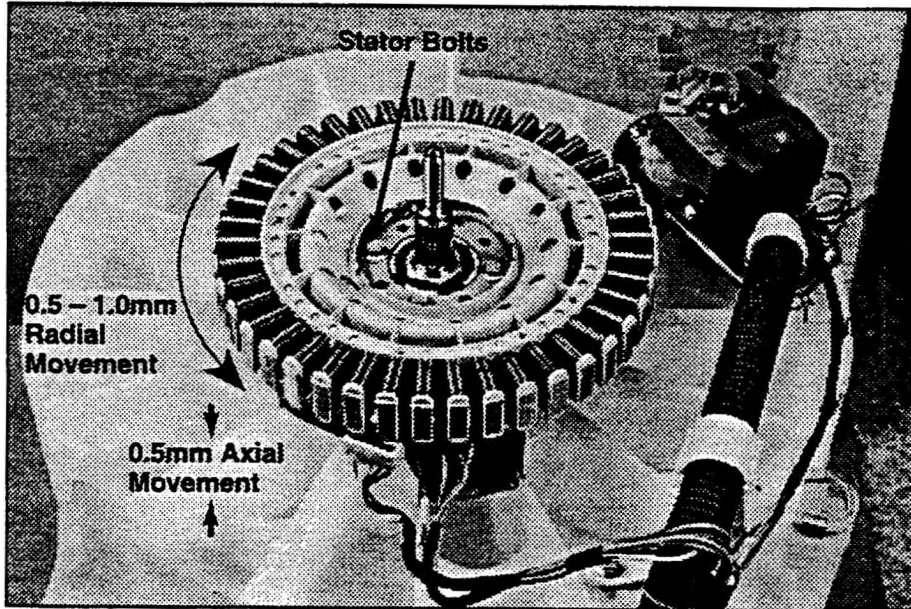


- (i) Grease the stator side of the clamp plates and the inside section of the stator that fits over the bearing. Fit the clamp plate and spacer assembly to the back of the stator. Locate the stator into position. It will only fit in one position.



j) Refit the clamp plate onto the stator and tighten the four 3/8" bolts to a torque of 5 nm.

Note: The stator should have some slight radial movement on the resilient mounts of approximately .5 - 1mm when correctly tightened as shown by arrows on the diagram below and should have minimal axial play (rocking movement) of .5mm maximum.



(k) Fit the wiring harness into the securing clips.

(l) Fit the rotor onto the shaft and locate on the spline. Using a 16mm socket, tighten the plastic nut to a torque of 16 nm. Hold the rotor stationary until it is secured.

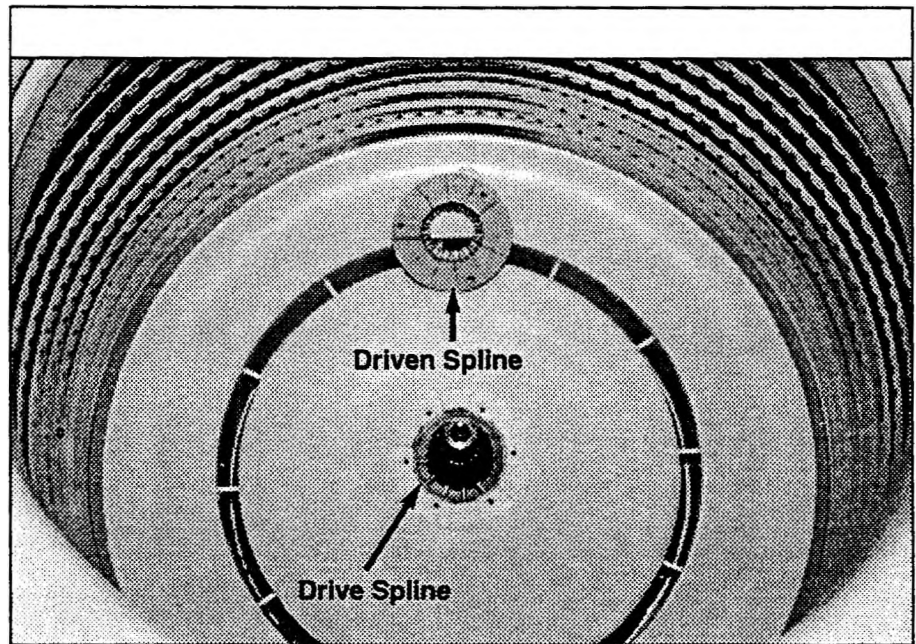
Note: Care should be taken not to catch fingers between the rotor and the stator.

(m) Flatten the base panel tabs. Refit the base panel.

(n) **Reconnect the machine, check the agitation and spin cycles.**

15.4 Clutch Disassembly

- a) Open the lid, remove the agitator nut and agitator.
- b) Remove the three screws securing the driven spline to the inner bowl. Lift off. **CARE MUST** be taken not to drop the screws into the bowl.



- c) Remove the drive spline from shaft.
NOTE: CHECK THE SPLINE ON THE SHAFT FOR ANY DAMAGE.
- d) Reassemble in reverse order. The screw torque is 2.5 nm.